The Economics of Television Consumption

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Preface

This thesis is based on my research at the Institute of Empirical Research in Economics at the University of Zurich and at the ETH Zurich. My thanks go first and foremost to my mentor Prof. Dr. Dr. h.c. mult. Bruno S. Frey. He challenged me to analyze the world from an economic perspective while always keeping in mind the limits of economic theory and being open to insights from other social sciences. The economic analysis of TV consumption presented in this thesis represents this broad understanding of economics. Moreover, his open-mindedness, his creativity and his enthusiasm for economic research were truly inspiring. He was always very supportive and many ideas reflected in this book were developed in numerous discussions. At the same time, he gave me the freedom to pursue my own ideas. Furthermore, he created an atmosphere at his chair where intellectual exchange and collaboration as well as personal support had their place and from which I greatly profited. Many conversations with Prof. Dr. Alois Stutzer, PD Dr. Matthias Benz, Dr. Simon Lüchinger, Susanne Neckermann, and Reto Cueni have influenced my thinking and the content of this thesis. I am particularly grateful to Alois Stutzer who introduced me to empirical happiness research, to Simon Lüchinger who never was tired of my questions while we shared an office, and to Susanne Neckermann and Lasse Steiner who read earlier drafts of this work with care. Many thanks go also to Isabel Ellenberger for her secretarial support. Prof. Dr. Reiner Eichenberger kindly agreed to assess the thesis as a co-referee for which I am very grateful.

The empirical applications in chapter 3 of the thesis are based on collaborative projects with Bruno Frey and Alois Stutzer. To highlight their contribution, I use the first-person plural "we" throughout that section. Nevertheless, the empirical analyses presented in chapter 3 have been expanded with new data and integrated into the broader analysis of TV consumption. Of course, I am solely responsible for any errors in this thesis.

For comments and suggestions on the papers upon which this thesis is partly based, I thank all persons mentioned above and many others. I am indebted to numerous persons who provided me with the data for the empirical research, but particularly to Dieter Meier and Corinne Lindner from *SuissImage*. I am also deeply indebted to Prof. Dr. Gérard Hertig whose generous job offer allowed me to finish this thesis. I thank Eric Young for the care with which he read the whole manuscript and improved the English.

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1. Introduction

During his 2008 presidential election campaign, Barack Obama spent 364 million US dollars, or 48% of his total campaign expenditures, on the media. The bulk of the money (313 million US dollars) went to the broadcast media, i.e., to TV and radio. While the republican candidate John McCain did not have the same amount of money at his disposal, he nevertheless spent 119 million US dollars on the media (and thereof at least 63 million on the broadcast media), which equals to 30% of his total campaign expenditures (Center for Responsive Politics 2009).[1] It is estimated that Obama spent more than 3 million dollars on a single 30 minute TV spot that aired on all major TV networks in the days leading up to the election (Rutenberg 2008).

The relevance of the mass media, and especially of TV, in the political process also becomes evident when looking at somewhat different spending figures: the bribes Montesinos, the Peruvian secret-police chief under then President Alberto Fujimori, paid to judges, politicians and the media. The bribes paid to television station owners were about one hundred times larger than the bribes paid to politicians or judges. The owners of the three largest TV stations received between 500'000 US dollars and 1.5 million US dollars a month, along with a multitude of other kickbacks, such as income from government advertising or assistance with lawsuits. In contrast, the owners of the largest newspapers received roughly 60'000 US dollars a month. Finally, TV was also responsible for overthrowing Fujimori's regime. The only TV station not complicit with Montesinos, the small cable channel *Channel N*, aired a videotape showing Montesinos bribing a congressman (McMillan and Zoido 2004). These examples illustrate that television and the mass media in general are an important and independent political force. Several studies thus show that private ownership of the media, press freedom and low concentration in the media market are, for example, associated with better government accountability (Besley and Prat 2006), less corruption (Brunetti and Weder 2003) or increased political rights and improved social and economic outcomes (Djankov et al. 2003).

The media are also very relevant with regard to the demand side. Radio and TV are the technical inventions of the 20th century with the highest and quickest diffusion rates. Only 7 years after the introduction of television, 75% of US households were in possession of a TV

[1] The Campaign Media Analysis Group (2008) publishes somewhat different figures and estimates that the Obama campaign spent 236 US dollars and the McCain campaign 126 million US Dollars on TV ads only.

set. Radio diffused with a comparable speed (8 years to reach 75% of US households). Neither the fridge (23 years) nor the telephone (67 years) had a similar success (Bowden and Offer 1994). The importance of media is also reflected in the amount of time people spend absorbing it. In Germany, the average citizen consumes more than five hours of media per day, whereby TV viewing constitutes by far the most time-consuming media consumption activity (Grahn et al. 2003). In 2006, Europeans spent on average over three hours a day in front of the TV, and US Americans spent around five hours (IP Network 2007). Europeans spend on average between 30 and 50% of their leisure time watching TV and video (Winqvist 2004). While much of the time watching TV is spent on entertainment programs, television is still the most important source of information for many people in many countries. 60% of respondents from the European Social Survey[2] indicate that they spend more than half an hour a day on news and political programs on TV, while only about 30 and 20% do so for radio and newspapers, respectively.

The analogy between the importance of media in the political and economic sphere and the omnipresence of media consumption in people's everyday lives points to an interesting analytical starting point: the analysis of people's time use is not only interesting per se, but also of considerable relevance for the understanding of the impact of media on the economy, on politics and on individual welfare. This dissertation, therefore, aims at studying media demand and, specifically, the effects of TV consumption on individual behavior and well-being from an economist's point of view.

Such an analysis is especially interesting, because, quite in contrast to its ascribed importance in the political sphere and its predominance in people's lives, TV receives at best a mixed appraisal in society (and in scholarly literature). While hardly anyone denies that TV viewing is a convenient form of entertainment and source of information, television has a quite negative image. The concerns raised can be divided into two categories. At a social level, worries have been articulated that TV boosts crime, endangers the proper functioning of democracy, lowers voter turnout and decreases social capital. At an individual level, it is doubted that TV serves a rational purpose. People supposedly watch too much TV or are even addicted to it. In fact, 40% of US adults and 70% of US teenagers admit that they watch too

[2] The data is from the first two waves of the European Social Survey carried out between 2002 and 2007 in 27 European countries (see Jowell et al. 2003; 2005). For a detailed description of the media consumption questions see chapter 2.4.

much TV according to their own view (Kubey and Csikszentmihalyi 2002). Some individuals totally abstain from watching TV because they know that otherwise they would not be able to control their television viewing behavior. Television has even been called a "plug-in drug" (Winn 1977).

However, one should note that almost every new form of entertainment or media was initially subject to severe criticism – be it novels of the late 18th century, whose reading was considered "almost as disreputable […], as to be found betting at a cock-fight or a gaming table" (McHenry 1824, p. 1; cited in Orians 1937, p. 197), the Penny Papers of the 19th century whose sensation mongering coverage of court cases was accused of "corrupting […] social and moral habits" (Colored American 1840), the cinema, radio, and even the telephone, which was deemed in 1926 by the Knights of Columbus Adult Education Committee, to "make men lazy" and "break up family life and the old practice of visiting friends" (Fischer 1992). Yet, television is probably unique with regard to the amount of scientific research that goes into it. In many fields of social sciences, be it sociology, psychology, political sciences and, media and communication sciences, researchers began investigating television's suspected alleged negative – and positive – consequences immediately following its introduction into society. Only the economists were late to follow suit. While the subfield of media economics has existed for some decades, it was mainly concerned with the media and television as an industry and thus confined itself to economic analyses *within* this industry. Only recently have economists started to recognize the media in its role as an information provider and therefore to analyze its impact on individual behavior and well-being.

There might be several explanations for this neglect. One reason is surely that information did not play any major role in economic theory until the 60s and 70s. Individual actors were assumed to be fully informed in standard economic theory, such as general equilibrium models (see, e.g., Arrow and Debreu 1954; Debreu 1959). While in the 60s some economists such as Stigler (1961; 1967) or Ozga (1960) recognized the importance of information or analyzed its value, they argued that standard results of economic models would still hold under imperfect information once information costs were taken into account. Information search costs were just regarded as transaction costs (see Stiglitz 2000; 2002). A major breakthrough was then realized with the recognition that information goods differed in several important aspects from normal commodities and featured aspects common to public goods (see Stiglitz 2000, p. 1448-1449; and chapter 2.2.1). Furthermore, the analysis of two of the most prominent information problems on markets, adverse selection (Akerlof 1970) and

moral hazard (Arrow 1963; 1968) showed that many of the major predictions of the standard models did not hold even when only small information costs were taken into account. However, in the early models, market participants were still passive, and only in the later screening and signaling models active information search was introduced (for a review see, e.g., Riley 2001). Still, how information acquisition actually takes place and what role information intermediaries, such as the mass media, play seems not to be a topic of general interest in the information economics literature.

The picture is somewhat similar within the field of political economy and public choice. Downs (1957a; b), among others, already recognized the high importance of information for voters and the entire political process and also discussed the role of the mass media. Yet, his insights in that latter area were not really recognized or further developed by other scholars. While the idea of rational ignorance received some attention, Downs' discussion of the role of professional data gatherers and publishers, as he calls the media, and of voters acquiring news "accidentally" through free sources as a side-effect of entertainment or purely of interest, has not attracted much research until recently.[3] As Hosp (2005, p.36) notes, the term "media" does not even appear in the index of well-established textbooks in the field, such as those by Mueller (2003) or Persson and Tabellini (2000). Only since recently have studies appeared that recognize the role of the media on economic as well as political markets. This "new" media economic literature combining the insights from traditional, industrial economic oriented, media economics with political economy and institutional economics is, however, still in its early stages and leaves many interesting questions unanswered. Specifically, the demand side has not yet received much attention.

Nevertheless, the question arises if it is still interesting and warranted to write an entire dissertation on television consumption. While economists might be a bit late in integrating the media – and television – into their framework, research on TV in other fields of social sciences is already plentiful. Furthermore, new technologies and new forms of media, such as the internet, are advancing and might replace television as the dominant source of entertainment and information. Nonetheless, there exist several reasons why an economic analysis of television consumption remains relevant. First, there are still many open questions regarding the suspected effects of television on individual behavior and well-being. One issue

[3] Among the earlier exceptions are, e.g., Tollison et al. (1975) on the role of media attention on voter turnout or Crain and Goff (1986) on political advertising and televising legislatures.

that is very important to economists is the empirical identification of *causal* effects. Many empirical studies exist that show a correlation between media related variables and some outcome variable, for example, between individual television consumption and political knowledge or participation (see, e.g., Norris 2000). Many researchers then, implicitly or explicitly, assume some direction of causality: Either television, because of its meager political content, leads to decreased interest in politics, or those persons who are less interested in politics tend to watch more TV. While negative effects are often ascribed to television without proper empirical basis, economic studies try to challenge (or confirm) these conventional conclusions using stringent empirical methods. The empirical applications in this dissertation attempt to exemplify where the prospects and limits of such an approach lie.

Second, and even more importantly, recent advances in economics make it possible to readdress (old) questions. The field of economics and psychology (or behavioral economics), which integrates psychological insights into economic theory and tries to advocate a more realistic model of human behavior than the standard economic model, leads to new analytical starting points and different conclusions. For example, the paradigm of revealed behavior is questioned. People sometimes commit systematic mistakes, which makes it impossible to infer utility from choice (see, e.g., Thaler 1992). It seems likely that TV watching is exactly a case where not all people are able to follow what is in their best interest. They might be tempted to watch more TV than they have planned on, or they would like to watch, both ex ante and ex post, which results in lower utility. Another development in economics now makes it possible to investigate this proposition empirically. A large literature shows that utility can be empirically approximated by measures of subjective well-being, or more concretely, reported life satisfaction (for reviews see, e.g., Frey and Stutzer 2002a; b; Layard 2005; Frey 2008). Such data make it possible to directly investigate the utility consequences of TV consumption. Last, large multinational datasets at the individual level that include measures of media consumption as well as subjective well-being have become available in recent years. This makes it possible to empirically investigate television's impact on behavior and well-being on a large scale. These various recent developments allow for a new understanding of television consumption. Furthermore, the research hopes to provide new insights beyond the close applications presented in this dissertation.

The goal of the dissertation is therefore to integrate the analysis of television consumption in a modern economic framework that goes beyond standard rational choice theory and to empirically investigate, within this framework, the effects of TV consumption on individual

well-being and behavior. The remainder of the dissertation is composed of three main parts and a concluding chapter. The first part (chapter 2) provides the conceptual and empirical basis while the second and third parts (chapters 3 and 4) present specific empirical applications investigating the impact of TV consumption on subjective well-being and on the behavior of voters and politicians, respectively. Finally, chapter 5 concludes.

Specifically, chapter 2 integrates television consumption into an economic framework and lays out the economic literature related to media consumption. Of course, there also exists a broad and vast literature in other disciplines that is related to the analysis of TV consumption. While it is beyond the scope of this dissertation to provide a complete review of this literature, I discuss the relationship with other disciplines and present specific contributions important for the later empirical analyses. The next sections in chapter 2, then, make the first steps towards an empirical analysis of TV consumption. To empirically asses to importance of media consumption and its effects on well-being and behavior, media consumption first has to be measured. I therefore discuss and evaluate different measures and measurement techniques. Furthermore, using one of these measures – the self-reported time spent watching TV – I study the determinants of TV consumption at individual as well as at institutional levels. Last, the conceptual analysis is extended beyond the standard rational choice framework and two extensions most relevant for TV consumption are discussed: the role of self-control problems and of utility misprediction. In sum, chapter 2 provides the theoretical and empirical background for the remaining parts of the thesis, which examine the consequences of TV consumption.

Chapter 3 of the thesis provides an empirical study of the relationship between television consumption and subjective well-being. The main hypothesis is based on the idea that, due to its immediate benefits at negligible immediate marginal costs, TV consumption can be more tempting than the pursuit of more engaging activities. As a consequence, individuals with incomplete control over, and foresight into, their own behavior watch more TV than they consider optimal for themselves, and their well-being is lower than what could be achieved. Data on subjective well-being or, more concretely, life satisfaction can now be used to investigate this proposition empirically. The results indicate that heavy TV viewers report lower life satisfaction, ceteris paribus. The question then arises in which direction causality goes: does watching TV really make people unhappy or do unhappy people just watch more TV? I propose several extensions of the basic analysis to investigate this issue. First, a path analysis highlights the different mechanisms through which TV consumption might lead to

lower subjective well-being. The empirical results indicate that long hours of TV watching are linked to higher material aspirations and anxiety. Second, the economic analysis in chapter 2 suggests that time costs are the most relevant costs in the case of TV consumption and leads to the hypothesis that particular people with significant opportunity cost of time will hurt their own well-being. The empirical results reveal that heavy TV watching is indeed associated with significantly lower life satisfaction among the self-employed, busy professionals and people with flexible working hours but not among the unemployed and retirees with a large amount of free time and among people with fixed working hours. Third, television is likely to be more tempting when people have a large choice of TV channels and can expect a good match between offered programs and their own preferences. The empirical analysis shows that heavy TV viewers do not benefit when exposed to many TV channels but instead report lower life satisfaction. In sum, the findings suggest that an identifiable group of persons do not adequately take into account the costs and experience a self-control problem when it comes to TV viewing.

Chapter 4 of the dissertation presents an empirical application of the impact of television on the behavior of voters and politicians. The basic idea is that TV consumption may have a specific impact because, due the importance of animated pictures on television, TV news differs from news in newspapers or other media in systematic ways. Person-related information is relatively more important than factual information and news is presented in a simpler style. TV might therefore attract a different audience than other traditional media. Specifically, people with lower interest in politics and with lower education might be attracted by TV's simpler style and its combination of news and entertainment but still profit, intentionally or unintentionally, from their TV consumption. To mitigate causality problems the presumably exogenous variation of the diffusion of local TV in Switzerland at community level is investigated. The data reveal that the presence of local TV induces people with low education to consume more news which has a positive effect on their participation in elections. The scope of the analysis is then broadened by analyzing how parties and politicians react to the presence of local TV stations. It is hypothesized that the political actors might have incentives to change the focus of their election campaigns from issues of content to the promotion of people. Accordingly, the empirical results indicate that the number of candidates for Council of States elections increases when local TV is available. All effects are strong when local TV markets match well with sub-national jurisdictions or electoral districts

and are not statistically significant when local TV markets span over several jurisdictions, which lends additional support to a causal interpretation of the results.

While the empirical applications all highlight different aspects of the causes and consequences of television consumption, they all show that a systematic economic analysis leads to interesting and relevant new insights. Hence, the last chapter draws conclusions for economic research on media consumption and for media policy. As the different parts of the dissertation show, television can have various intended and unintended beneficial and harmful effects on individuals as well as spill-over effects on society as a whole. This makes it notoriously difficult to deduct concrete policy recommendations from specific studies or empirical results. To avoid giving naïve policy recommendations, I discuss the challenges faced by the empirical studies presented in this dissertation as well as by the literature in general. Finally, the chapter also suggests directions for future research.

2. An Economic Analysis of Television Consumption: Rational Choice and Beyond

2.1. Introduction

This dissertation studies the effects of television consumption on behavior and well-being from an economist's point of view. To do so, this part of thesis integrates TV consumption into an economic framework.

Chapter 2.2 discusses several basic concepts related to an economic analysis of television consumption. First, information and media goods and media markets differ in several respects from "normal" goods and markets. As these specific characteristics are relevant for consumption decisions the chapter shortly summarizes them. Second, the chapter integrates TV consumption into a rational choice framework and, specifically, the household production approach. This approach stresses that households need both market goods and time to produce more basic commodities that enter their utility function. Hence, the approach emphasizes the role of opportunity costs of time for media consumption decisions. Third, the chapter presents the specific contributions of the media economics literature to the analysis of TV consumption. Where necessary and appropriate, I also discuss contributions from other social sciences such as media and communication studies, political sciences, psychology and sociology. However, it has to be emphasized that it is not the goal of this chapter to provide a complete literature review. The literature on media and media consumption in the different disciplines is so vast that it would be impossible to give enough credit to all the fields. The selection of literature discussed does also not intend to reflect some kind of objective importance or quality, but rather provides a basis for the empirical analyses in the remaining parts of the dissertation.

The following three chapters make the first steps towards an empirical analysis of TV watching. I outline the different measures and measurement techniques of media consumption (chapter 2.3) and study individual (chapter 2.4) as well as institutional (chapter 2.5) determinants of TV watching. I exemplify the latter in an empirical application analyzing the effects of public broadcasting on TV consumption. The whole analysis in these three chapters is done within the rational choice framework outlined in chapter 2.2. Recent developments in economics, often summarized with the term *economics and psychology* or *behavioral economics*, however, acknowledge the limits of this standard economic approach and try to

integrate insights from psychology into the economic model of human behavior (for general discussions and reviews of the field see e.g., Frey and Stutzer 2001; Frey and Benz 2004; Pesendorfer 2006; Frey and Stutzer 2007; DellaVigna 2009). Chapter 2.6, therefore, goes beyond the rational choice approach. It emphasizes two aspects discussed in the economics and psychology literature that are relevant for television consumption: self-control problems and utility misprediction. Thus, section 2.6 lays the theoretical foundations for chapter 3 of the dissertation, the empirical analysis of the effects of TV consumption on subjective well-being.

In short, this part of the thesis mainly discusses the theoretical background and the *determinants* of TV consumption. Based on this analysis, the following parts of the thesis then study the *effects* of TV consumption.

2.2. Basic Concepts of the Economics of Television Consumption

An economic analysis of television consumption can build on a broad and vast body of literature not only in economics, but also in related disciplines such as media and communication studies, sociology, psychology and political sciences. In economics, two subfields are of special relevance. First, the analysis of media consumption can be seen as an analysis in the tradition of the *economic approach to human behavior*. This rational choice approach has been successfully applied to many fields beyond narrow economics (see, e.g., Becker 1976; Stigler 1984; Frey 1995; Lazear 2000), and it can also be used to understand television consumption behavior. Second, there exists the specific field of *media economics*. While early literature in this field dealt mainly with industrial economic aspects of media markets, in recent years its scope has broadened towards a political economic and institutional economic analysis of the media. This field of research can therefore contribute a great deal to the understanding of TV consumption. Hence, section 2.2.2 discusses TV consumption as an individually rational calculus, while section 2.2.3 – selectively – lays out what the specific media economics literature can contribute to this analysis. Whenever appropriate, contributions from other social sciences are discussed as well. First however, before discussing television consumption in the light of these two economic fields, section 2.2.1 briefly summarizes the specific features of information, media goods and media markets.

2.2.1. Specific Features of Information, Media Goods and Media Markets

Information and media goods exhibit some distinctive features that distinguish them from "normal" commodities. Likewise, media markets differ from normal product markets in several dimensions. As these specific characteristics influence the behavior of participants in media markets, including consumers, they are shortly outlined here. For more detailed descriptions of the characteristics and their implications see, e.g., Hamilton (2004) or Hosp (2005).

First, the production of information goods is characterized by high fixed costs and low variable costs (e.g. Shapiro and Varian 1999, p. 3; Hamilton 2004, p. 9; Hosp 2005, p. 24). Another aspect important for the production of media goods is the many product dimensions characterizing media content leading to a much differentiated media product. News stories, for example, can vary in focus, length or style of presentation (Hamilton 2004, p. 9). This product differentiation in combination with the cost structure of high fixed costs and low variable costs can lead to so-called preference externalities among consumers. The larger a

group of consumers in a market who share specific preferences, the more suppliers will target that consumer group and the more likely these consumers will consume, e.g. by reading a newspaper (Hamilton 2004, p. 18-21). Empirical evidence shows that such preference externalities are important in newspaper, television, as well as radio markets (George and Waldfogel 2003; Waldfogel 2003; 2004). Similarly, larger and integrated markets lead to better product quality (Berry and Waldfogel 2003).

Furthermore, information features aspects common to public goods, especially non-rivalry in consumption and to some extent also non-excludability. Even if exclusion is sometimes technically possible, it is mostly socially inefficient (Samuelson 1958, p. 335; 1964; Stiglitz 2000, p. 1448; Hosp 2005, p. 21). These features have an impact on the (legal) definition and enforceability of property rights of information and media goods and lead media producers to search for opportunities of financing beyond that of consumer payments (Shapiro and Varian 1999). Advertising is therefore the most widespread means of financing mass media (see the section on two-sided markets below). The lack of adequate direct financing by consumers and the resulting indirect financing through advertisers lead to different, maybe inferior, market outcomes than would result from information being a proper private good.

External effects (positive and negative) of media consumption are related to the public good problem. Positive externalities are supposedly rather prevalent in the political sphere. Regularly informing oneself about politics not only benefits the individual, but the whole of society as well because a functioning democracy requires informed citizens. Similarly, the "rational ignorance" hypothesis by Downs (1957a) argues that individual citizens do not have sufficient incentive to inform themselves about politics to the degree necessary for a properly functioning democratic society, because the individual vote or participation in the democratic process is not decisive. Because consumers, thus, do not demand enough political information, an unregulated market therefore produces a lower amount of information than socially optimal (see, e.g., Sunstein 2000, p. 517). In the European media economic tradition, information and media goods are therefore often termed "merit goods" (see, e.g., Heinrich 1994; Kiefer 2003). Negative externalities, on the other hand, are often ascribed to violent or sexually explicit media content, especially on TV or the internet, and with regard to children (for a further discussion see chapter 3.1). Both cases of positive and negative externalities often call for regulatory intervention.

An additional specific feature of information and media goods relates to their designation as so-called "experience goods". In contrast to normal commodities, the quality of information

cannot be verified unless it is acquired. This leads to the increased importance of branding and reputation on media markets, as well as to consumers basing their quality expectations and consumption decisions significantly on their previous experience with media suppliers (e.g. Shapiro and Varian 1999 p. 5-6; Gentzkow and Shapiro 2006).

Because mass media are essentially financed by advertising, media markets are two-sided markets: customers of media firms include both consumers as well as advertisers (e.g. Picard 1989; Anderson and Grabszewicz 2006). Hence, "[w]hen news outlets sell 'eyeballs' to advertisers the question becomes, 'What content can attract readers or viewers rather than what value will consumers place on content?'" (Hamilton 2004, p. 29). This can result in different biases of the market outcome. Minority programs will be undersupplied although the minority may place a large value on that type of programming, and low-cost programs will dominate high-cost programs. In other words, the intensity of preferences of consumers will not be appropriately reflected in the market. Furthermore, the market structure can result in undersupply or oversupply of advertising (Anderson and Grabszewicz 2006).

A last aspect refers to competition in media markets actually being a competition for the time and attention of consumer and not for their money (see, e.g., Shapiro and Varian 1999, p.6-8). Attention has even been named "the ultimate scarce resource" in information economies.[4] With regard to television consumption, it is interesting to note that consumers often do not pay complete attention, i.e., TV viewing is often a secondary activity accompanied by other tasks. Furthermore, (political) information acquisition may often be an unintended consequence of TV or other media consumption for entertainment as many programs bundle entertainment and information aspects. Some audience theories also argue that media consumption is passive and habitual, giving leeway to strong media effects and externalities (see Hosp 2005, p. 25-26).

In sum, media goods and media markets differ from "normal" goods and markets in several distinctive ways. These specific characteristics have to be taken into account in the further economic analysis of television consumption in the following chapters.

[4] For a review of the psychological literature on attention see Pashler (1998) and for an economic analysis of the attention problem from advertisers' perspective see Anderson and de Palma (2008) and Falkinger (2008).

2.2.2. Television Consumption as an Individually Rational Calculus

Media consumption choice can be analyzed within the framework of the economic approach to human behavior, also referred to as the rational choice approach. The basic idea behind this approach, which has most prominently been associated with the work of Gary Becker, is that economic theory can be useful in analyzing areas beyond narrow economics (see, e.g., Becker 1976; Stigler 1984; Frey 1995; Lazear 2000). For example, the approach has successfully been applied to many aspects of consumer and household behavior (for an overview, see Lazear 2000).

The household production approach

Most relevant for the analysis of TV consumption are economic theories of non-working time use.[5] The household production approach proposed by Becker (1965) and Michael and Becker (1973)[6] argues that households combine market goods and time to produce basic commodities that enter the household's utility function. Gronau (1977; 1980) refined Becker's idea and introduced an explicit distinction between home production and leisure: "An intuitive distinction between work at home (i.e., home production time) and leisure (i.e., home consumption time) is that work at home (like work in the market) is something one would rather have somebody else do for one (if the cost was low enough), while it would be almost impossible to enjoy leisure through a surrogate. Thus, one regards work at home as time use that generates services which have a close substitute in the market, while leisure has only poor market substitutes" (Gronau 1977, p. 1104).

Hence, the household production approach, both in Becker's and in Gronau's framework, emphasizes that not only money expenditures – the traditional focus of economic consumption theory – should be taken into account but that also time costs should be taken seriously in consumer economics. Time budgets constrain consumers' as much as monetary

[5] The importance of time constraints and opportunity costs of time has also been recognized in labor market economics, where analysis is done on how individuals allocate their time between labor market activities and leisure. However, the allocation of time between different leisure or household production activities is not included in these models. See Juster and Stafford (1991) for a comparison of traditional labor supply models and the household production approach.

[6] Forerunners of Becker are e.g. Reid (1934) and Mincer (1962). A similar consumption theory to the one proposed by Becker is outlined by Lancaster (1966). In his theory goods possess several "characteristics" that enter separately into a consumer's utility function similar to Becker's "commodities".

budgets. With regard to TV consumption the time costs are probably even more important than the monetary costs, especially for marginal decisions. Once a household possesses a TV set and possibly a regular cable or satellite subscription, the marginal monetary cost for watching an additional hour of TV is basically zero.[7]

While the household production approach attracted much criticism, both on theoretical grounds and with regard to its empirical applicability (e.g. Pollak and Wachter 1975; Quah 1986), it nevertheless leads to some testable predictions that have found empirical support. The bulk of empirical research examines the effects of home production and its technology on labor supply or labor related fields, such as education or travel mode and time (see Gronau 2006, p.1; for a review of the research field see Gronau 1986; 1997). The studies that explicitly apply household production models to media and news consumption are discussed below.

A major drawback of the basic household production model is that it assumes constant returns to scale and the absence of joint production (Pollak and Wachter 1975). In Becker's model, time enters an individual's utility function only insofar as it is used to produce the basic commodities, i.e., time has no separate consumption value (and also no specific disutility is associated with any time use). In the case of TV consumption, this would mean that time is just an input into the production of, for example, information. There is no specific benefit, besides differences in money and time costs, associated with allocating time to a certain type of media as long as the output, e.g. the information acquired, is the same. Gronau, on the other hand, strictly separates between home production and leisure. A specific time span of TV watching would therefore have to be classified as leisure or as home production activity but could not be both at the same time. However, some more recent discussions of time use specifically include such "joint production" and allow for allotment of the same activity to both production and leisure (e.g. Graham and Green 1984). The concept is also referred to as "process benefits" (Juster 1985a) or "activity benefits" (Gørtz 2006). A similar model is also presented by DeSerpa (1971), who not only includes the commodities into the utility function but also directly includes the time. Individuals are assumed to be able to allocate more time than strictly necessary to the consumption of commodities and to directly benefit from such a

[7] This is not true in the case of pay-per-view television. However, pay-per-view TV is, in most countries, not (yet) common. For the argument that pay-per-view TV would correct some market failures inherent in free, advertising based TV see Sunstein (2000, p. 514).

time use. Another extension relevant for TV consumption examines simultaneous time use (Williams and Donath 1994). Thereby, the focus is not on an activity having both a production and a consumption component, as in the discussion about joint production, but on the simultaneous performance of multiple activities. TV watching is one of the classical examples of secondary time use: for example, people often have a meal or perform some household chores when watching TV. Other models within the household production approach analyze the demand for variety (Gronau and Hamermesh 2008) or for synchronous leisure (Hallberg 2003; Jenkins 2005; see also Corneo 2005). More general discussions of time allocation decisions from an economic perspective are, e.g., provided by Hill and Juster (1985) or Juster and Stafford (1991).

Models of media consumption

While some prediction regarding TV consumption and its determinants can of course be obtained from these general economic models of time use and household production, there exist models more narrowly related to TV consumption. These models are specifically engaged with the demand for information and media goods. For example, Ekelund and Watson (1994) and Hosp (2005) directly adapt Becker's model of household production to news and entertainment consumption from the media. In these models, individuals receive utility from consuming the commodities "news and entertainment" from various sources whereby news and entertainment are produced with a combination of goods purchased on the market and time. Households are constrained by their monetary income as well as by their time and can allocate their total available time either to labor (i.e., acquisition of monetary income) or to household production of news and entertainment. This model shows that the cost of the basic commodity "news and entertainment" is determined by the price of the market input (e.g. the price of a newspaper), the wage rate (i.e., the opportunity cost of time) and the time intensity and goods intensity of the commodity. This simplified model allows for analysis of how media consumption reacts to changes in those parameters. For example, the model conveys that rising wages (i.e., increasing opportunity costs of time) increase the cost of all media consumption activities.[8] Yet, the relative price of time intensive types of media increases more than the relative price of goods intensive types of media and, hence, households will tend to substitute away from the former towards the latter.

[8] For a discussion about the value of opportunity costs of time and if these costs should be set equal to the wage rate see e.g. Shaw (1992).

Ekelund and Watson (1994) argue, based on this model, that the decrease in newspaper readership over time can be explained by rising real wages and increasing labor participation rates which lead to households switching to less time intensive news service providers such as TV and radio. Television and radio consumption are argued to be less time intensive as they allow for secondary activities such as consuming a meal, driving or carrying out household chores. Hosp (2005) investigates, based on the same model, how differences in quality expectations regarding newspaper content, i.e., differences in productivity of time of newspapers, affect newspaper consumption time. The increase in productivity of time through higher quality leads to newspaper consumption becoming less time intensive and to the decrease of the relative price of newspaper consumption. Households are therefore expected to increase their newspaper consumption.[9]

The model of media consumption based on Becker's household production approach however neither includes joint production nor simultaneous time use, both which are important in the context of TV consumption. Although Ekelund and Watson (1994) argue that simultaneous time use is lower for newspaper consumption as compared with other media consumption activities, they do not explicitly model this aspect. Williams and Donath (1994) estimate an empirical household production model including primary and secondary activities and conclude that input hours of two simultaneous activities should be weighted with one-half for each activity. Hence, the authors share the conclusion that activities such as TV watching, which allow for the undertaking of another activity at the same time, feature (ceteris paribus) lower time costs. Similarly, a household production model that includes joint production or activity benefits will predict more time being allocated to TV watching than the usual model without such extra benefits (see, e.g., Gørtz 2006, p. 14).[10] Comparative static predictions,

[9] The decrease in relative price leads, of course, to a substitution as well as an income effect. It is theoretically not clear which of the two effects dominates, i.e. if newspaper consumption will increase or decrease due to the lower relative price. Yet, if there exist close substitutes to newspapers, such as radio, TV or internet, households will tend to substitute away from those media to newspapers, and newspaper consumption can be expected to rise (see Hosp 2005, p. 82).

[10] In a household production model without joint production, each household member will choose a level of home production activities where the marginal product of household production equals their wage rate. Including activity benefits in the model leads to a level of household production activities where the marginal product of household production equals the wage rate corrected for the part of individual housework activity perceived as leisure (Gørtz 2006, p. 14). The same argument applies for the allocation of time between different household production activities, e.g. between different media consumption activities. While the standard household

e.g. regarding the effect of changing opportunity costs of time, will nevertheless remain similar. However, it is difficult to predict the activity benefits of different media consumption activities, as they presumably depend on the households' preferences.

A more specific dynamic theory of media consumption than the application of the general household production model is provided by Mathewson (1972). Within his model, he directly includes the process in which knowledge accumulates through the expenditure of time and money on media consumption. Thus, media consumption, on the one hand, provides direct utility as the good "entertainment" and, on the other hand, indirect utility insofar as a higher stock of knowledge regarding the nature of other goods leads to better consumption decisions. This model leads to more specific predictions than the models summarized above. For example, increasing wage rates have two different effects on the demand for information. First, as above, opportunity costs of time are higher, which has a negative effect on the demand for information. Second, a larger potential income can be allocated over goods and, thus, more information is demanded in order to make well-informed consumption decisions. The net effect of increasing wage rates on media demand is therefore ambiguous.

Related literature

Most audience theories in communication studies are media centered in the sense that they examine the different effects media can have on the audience (see, e.g. Kitzinger 2004, p. 170). Media consumption is thereby often assumed to be passive and habitual. The uses-and-gratifications approach, however, takes a different perspective and is similar to the economic approach presented here. Uses and gratifications theory investigates from a psychological communication perspective the motivation and the behavior of the audience. Instead of analyzing what the media do to the public, it asks what the public does with the media (Rubin 2002). A large number of studies investigate the different functions television can have. It is thereby assumed that individuals use the media in an active and goal directed manner to satisfy their needs and desires. A trade-off between different sources of gratification takes place and individuals spend their time and mental resources where they expect the most

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production model predicts that household members should allocate their time such as the marginal product of the different activities is equal, the prediction does not hold anymore if the different media consumption activities feature different activity benefits. The problem is somehow circumvented if it is assumed that media consumption simultaneously produces entertainment and information and that the different media consumption activities differ in their productivity of time with regard to these two commodities.

benefit. Similar to the economic approach they maximize their utility given their preferences and restrictions (Jäckel 1992, p. 248). Furthermore, it is assumed that individual differences lead each viewer to use and react to media content in a different manner. The uses and gratifications approach is often criticized as being too individualistic and for not leading to any testable propositions (Jäckel 1992, p. 249). In economic terminology, the approach focuses rather on the influence of different preferences on media demand and much less on the effect of differences in restrictions.

In sum, only a few studies place TV consumption (or media consumption in general) within an economic framework and try to empirically investigate its determinants from an economic perspective. Among the few exceptions are the above-mentioned studies by Ekelund and Watson (1994) and Hosp (2005), which focus on some specific influences, as well as an earlier study by Bryant and Gerner (1981) that investigates the relationship between socio-economic characteristics and TV consumption. Yet, there exists a large body of literature in the field of media economics. Most studies usually do not focus on TV consumption as such. Nevertheless, much can be learned from this research field and it is therefore – shortly and selectively – summarized in the next section.

2.2.3. Media Economics and Media Consumption

Media economics, a research field at the crossroads of economics and communication studies, is a rather young field. In its beginnings, the field mainly focused on an industrial economic and business economic analysis of media markets and media firms. However, the period after the 90s has also seen an increase in research on media in the sense of the rational choice approach to human behavior, i.e., research in the form of an economic analysis of issues genuine to media and communication sciences.[11] Hence, Hosp (2005), for example, distinguishes three phases or areas of economic research on the media: media economics as a sub-discipline of industrial economics, media economics as an extension of political economy, and institutional economic analysis of the media.[12] Along these lines, this chapter

[11] For a historical account of the field from a primarily industrial economics perspective, see e.g. Albarran (2004) or Picard (2006).

[12] Other authors structure the field differently. Albarran (2004) divides media economics into microeconomic analysis, macroeconomic analysis and studies related to political economy. Picard (2006) differentiates between a theoretical, an applied and a critical tradition in media economics as well as between industry and market studies, company studies and effect studies.

explores what these different fields of the media economics literature can contribute to an analysis of television consumption. Whenever necessary or appropriate, I also revert to related literature in other fields. I thereby focus primarily on the literature related to the demand side of media markets and discuss general literature on media consumption as well as studies specifically on TV consumption. General reviews of the media economics literature, from different angles and viewpoints, are, for example, provided in Hosp (2005) and Albarran (2004), or in the well-known media economics textbooks by Picard (1989), Heinrich (1994), Kiefer (2001), Albarran (2002) and Alexander (2004), among many others.

Industrial economics of the media

A significant portion of media economics literature occupies itself with the production of media content as well as the analysis of the functioning of media markets and media firms. Usually, media economics textbook just cover these aspects. Hence, they are reflected in the textbook definitions of what media economics is about. For example, according to Picard (1989, p. 7) media economics "is concerned with how the media operators meet the informational and entertainment wants and needs of audiences, advertisers and society with available resources". Albarran (2004, p. 291) sees media economics involving "the application of economic theories, concepts, and principles to study the macroeconomic and microeconomic aspects of mass media companies and industries." Thus, industrial economic analyses are usually media centered, and media consumers as such do not play a dominant role. Of course, questions about price setting, advertising, new technologies, concentration, quality and diversity – to name a few topics of the literature – are also relevant for media consumption. It is however not the dominant interest of most studies that rather focus on the supply side. Exceptions are, for example, analyses of questions about effects of preference externalities among consumers or substitution between different media types or studies that directly analyze – theoretically or empirically – the effects of some market characteristic on demand and consumer welfare.

For instance, the study by Hosp (2005) mentioned in the previous section investigates the effects that the concentration on newspaper markets has on newspaper consumption in Swiss counties. Concentration and structure of media markets is a big issue in the media economics literature. Theoretically, it is not clear if more competition leads to better market outcomes and a better fulfillment of consumer preferences in two-sided media markets with high fixed costs and high product differentiation (see, e.g. Anderson and Coate 2005; George 2007).

Empirical studies, however, mostly focus on the supply side and try to evaluate the relationship between market concentration on some measure of media diversity or quality (see, e.g., McCombs 1988; Berry and Waldfogel 2001; George 2007). An exception is George (2007), who, besides supply side measures, also considers newspaper circulation. Circulation figures are however a very crude measure for newspaper consumption and Hosp (2005), thus, directly looks at newspaper reading time. He finds that reading time is lower in Swiss counties with higher concentration of newspaper markets and explains his finding with consumers having lower quality expectations and therefore spending less time on newspapers in more concentrated markets.

Other studies occupied with the demand side analyze the effects of market integration, the expansion of new technologies and the substitution between different media types. For example, George and Waldfogel (2006) show that the expansion of national newspapers (in their example the New York Times) leads to lower readership of local newspapers among groups targeted by the Times. Gentzkow (2006) finds that the diffusion of TV is associated with lower newspaper reading and radio listening. The same author also shows that internet newspapers in the US are (weak) substitutes for traditional print papers (Gentzkow 2007). Similar results are provided by Filistrucchi (2005) for the Italian newspaper market. George (2006) finds that especially younger, more educated and more urban individuals are drawn away from traditional newspapers due to internet diffusion. The debate still seems to be open in the case of magazines. Negative as well as zero effects are found for magazines' online content on magazine sales (Kaiser and Kongsted 2005; Kaiser 2006; Simon and Kadiyali 2007). With regard to the relationship between internet and television, Waldfogel (2009) finds in a student sample some substitution between web TV viewing (from authorized and unauthorized sources) and conventional TV viewing but also a large increase in total TV viewing due to web availability of TV content.

Political economics of the media

Another branch of the media economics literature considers the media not only as an economic but also as a political force and analyzes its effects on political actors and political outcomes. Hence, the media are seen as an institution that constrain and influence individual behavior. While the role and importance of information in the political process was recognized early by modern political economists (e.g. Downs 1957), the role of mass media

has only recently started to receive attention.[13] Theoretical and empirical work now evolves that highlights the importance of the media in filtering and distributing information to voters and therefore constraining government and well-organized interest groups in the pursuit of their own interests (e.g. Besley and Burgess 2002; Strömberg 2002; 2004a; b; Besley and Prat 2006; Dyck et al. 2008a). High diffusion of mass media, independent media ownership, media freedom and low concentration in media markets are therefore shown to be associated with various beneficial social, political and economic outcomes, such as lower corruption (Brunetti and Weder 2003; Gentzkow et al. 2006), less epidemic hunger (Besley and Burgess 2002), less corporate governance violations (Dyck et al. 2008b), less poverty and higher primary school enrolment (Djankov et al. 2003).

While there are also empirical studies that directly analyze how media and media institutions affect the behavior of politicians, voters and interest groups (see the discussion in chapter 4) media consumption is usually not part of these economic analyses. Hence, they contrast with a large number of studies in media and communication sciences that show relationships between media consumption and, for example, political knowledge and involvement. The latter studies are however problematic with regard to the identification of causal relationships as individuals endogenously choose the amount or kind of media consumption. For example, individuals who are better educated and more interested in politics will consume more media with sophisticated political content (see, e.g., Graber 2006). Economists therefore focus on the effects of supposedly exogenous variation in media institutions. There are, however, a few exceptions that also take some measure of media consumption into account. For example, Leeson (2008) finds that higher media freedom is associated with more media consumption and higher political knowledge. Interestingly, however, only a statistically significant relationship between media freedom and newspaper and radio news consumption, but not TV news consumption, is found (see also chapter 2.5). Prat and Strömberg (2005) analyze the introduction of commercial TV in Sweden and show that the previously uninformed are attracted by commercial television and begin watching its news. They also increase their

[13] The role of the mass media in politics, and especially in elections, was recognized much earlier in political sciences (see, e.g., Norris 2000) and media sciences. At the crossroads of the two disciplines, the field of political communication studies evolved (for reviews from the two different perspectives see, e.g., Ansolabehere et al. 1991; Semetko 2004). Regarding the effects the media can have on consumers, i.e. the power of the media, scientific consensus seems to continually change from strong media effects to no media effects back to strong media effects (for a historical overview of media effects research see, e.g., Bryant and Thompson 2002).

political knowledge and participation. A somewhat different result is found by Gentzkow (2006). He shows that the introduction of TV in the US is associated with lower newspaper readership and lower voter turnout.

Institutional economics of the media

Another strand of the media economics literature is not so much concerned with the effects of the media on other actors but rather with how the incentives of actors within the media are shaped by internal and external institutional settings. With regard to internal institutions, studies, for example, examine how ownership structures, journalistic independence and standards and other internal rules affect the incentives of media owners and journalists (see, e.g. Djankov et al. 2003; Fengler and Russ-Mohl 2005; Baron 2006). A systematic theory of journalism that integrates these aspects seems, however, not to exist (see Hosp 2005, p. 50). With regard to external institutions, interesting questions seek to address how legal rules and regulations (e.g. ownership or content regulations, laws regarding the access to information or privacy standards) or political and economic conditions affect the work of media firms and journalists.[14] The broader discussions about private or public ownership of the media, especially of broadcasting firms, fall partially into the realm of this institutional economic literature (see, e.g., Sunstein 2000; Kiefer 2001, and the discussion in chapter 2.5). The study by Prat and Strömberg (2005) presented above, thereby, also addresses the effects on media consumption.

In all these discussions, media consumers only play a marginal role. An exception, at least to some extent, is the literature on media bias. This literature focuses on the institutional settings that affect the extent of which the media tell the truth or not, i.e., to what extent they bias their news. Supply side influences, such as the ideology and career concerns of media owners and journalist, political pressure or economic pressure from advertisers (e.g. Baron 2006; Reuter and Zitzewitz 2006), as well as demand side requests are analyzed. Regarding the latter it, is argued that consumers prefer to confirm their preexisting (ideological) beliefs. Therefore, more competition on media markets does not necessarily lead to less media bias (e.g. Mullainathan and Shleifer 2005; Gentzkow and Shapiro 2006; 2007). A related strand of literature investigates the effects of media bias on consumers, especially on voters. While in the standard economic model, the media will not have systematic influence over rational

[14] There is, of course, a large overlap here with industrial and political economic literature on the media mentioned above.

voters, there are also studies that show the media may influence voters even when they have rational expectations (e.g. Eichenberger and Serna 1996; Congleton 2001).

There are other studies that touch upon the effects of institutions on media consumers. The study by Leeson (2008) mentioned above looks, among other aspects, at the effect of media freedom, i.e., of external legal and political institutional settings that affect media production, on media consumption. The geography of media markets also affects how and what the media reports on politics.[15] There is more coverage of local political representatives when media markets geographically match well with electoral districts. Voters in districts with a poor match between media and political markets therefore know less about their representatives, and representatives in this same scenario also do less for their constituencies (Snyder and Strömberg 2008). Media consumption as such is however not included in the empirical analysis. Economic institutions not directly affecting the media can also have an effect on media consumption. Ekelund and Watson (1994) show that increased labor market participation, i.e., higher opportunity cost of consumers, goes along with less newspaper consumption and more TV consumption. A completely different aspect is highlighted by Benz and Stutzer (2004), who analyze the effect of *political* institutions on political knowledge. It is argued that demand for political information is higher and people consume more news media and thus know more about politics when they have a larger say in the political process, i.e., when direct democratic rights are more extensive. However, only the direct effect of political institutions on knowledge is tested without empirically looking at media consumption.

[15] See also Bruns and Himmler (2008) who analyze the effect of the geographic distance between counties and media cities on media coverage and federal spending.

2.3. Measuring Media Consumption

In order to appreciate the role and importance of television in people's lives and to empirically analyze the causes and consequences of TV consumption it first has to be measured. A variety of measures and measurement methods exist to quantify media consumption or, specifically, TV consumption, which differ with regard to several aspects. A first aspect of differentiation refers to the specific facet of media consumption actually measured; a second aspect refers to the specific methodology or technique used for measurement. The two main facets of media consumption are money and time. Therefore, expenditure and especially time use measures are discussed together with other measures that capture certain aspects of media consumption. The discussion relates to the measurement of all three main media consumption activities (television, radio and newspaper consumption), and explicit differences between the three are specifically mentioned were applicable.

2.3.1. Expenditures

In many economic applications, consumption – be it total consumption or consumption of a specific good or a category of goods such as "food" – is equated with expenditures. Detailed expenditures are usually measured with representative interview surveys or diary studies. The U.S. Consumer Expenditure Survey, for example, is a combination of both. According to data from the U.S. Census Bureau (2009), in 2003 U.S. Americans spent about 720 US dollars on media, which roughly amounts to 3% of total consumption expenditures (26,455 dollars). Thereby, 234 dollars were spent on television (without video), 54 dollars on newspapers and 47 dollars on consumer magazines.[16]

While approximating consumption with expenditure data may be appropriate for many applications, in the case of media consumption, it grossly underestimates its importance. As discussed in the previous chapter, consumption can be seen as the output of home production, which needs two inputs, money and time. For (some types of) media consumption, the input of money is almost negligible compared to the input of time, i.e., a large part of costs are opportunity costs of time. Expenditure measures therefore only capture a (small) part of the relevant costs.[17]

[16] Detailed data on other types of media, such as radio, is not available.

[17] Different types of media feature different relations between money and time input. See also the discussion in chapter 2.2.2 and 2.4.2.

Nevertheless, such expenditure measures are also used for economic welfare analysis (see, e.g., Goolsbee and Petrin 2004). Goolsbee and Klenow (2006), however, argue that for media consumption and other time intensive goods estimates of price elasticity from expenditure data are difficult. Calculations of welfare gains of new products are therefore underestimated to a large extent. The authors' application to the internet shows that welfare estimates based on time use data are about ten times larger than standard estimates based only on expenditures.[18] A critical point in the analysis is, however, that the authors value leisure time at the wage rate (or a constant fraction of it), which is criticized by many scholars (see, e.g., Shaw 1992; Shaw and Feather 1999; Jara-Diaz et al. 2008). Media consumption is furthermore an exception in that it is often accompanied by other tasks, like having a meal, which makes the monetization of time costs even more difficult as there exists no clear rule on how to divide the opportunity costs between the two activities.[19]

2.3.2. Time Use

An alternative to expenditure measures or to the monetization of time are direct measures of time use.[20] There exist different techniques to measure time spent on the media, especially to measure time spent on watching television. I distinguish between and discuss three different types of techniques: electronic measurement, time use diaries, and survey questions. Not all techniques are equally suitable for all types of media. I discuss their limitations, advantages and disadvantages when describing the different techniques, while I add an overall evaluation and a comparison of the different methods the end of the section. An assessment of data quality and adequacy ultimately depends on the intended use of the data. Therefore, the discussion and evaluation of the measurement techniques always bears in mind that the data

[18] See also Petrin (2002) who uses data on utilization to improve conventional estimates of consumer welfare. Aguiar and Hurst (2005) provide another compelling example that equating consumption and expenditures may lead to misleading conclusions. While food expenditures drop after retirement, quality of food consumption stays the same because retirees spend more time on shopping and food preparation. Concluding from expenditure data that people do not smooth consumption over the life cycle (i.e. do not save enough for retirement) may, therefore, be wrong. Furthermore, Okada and Hoch (2004) point out that people spend time and money differently. They are for example less risk-averse with regard to time than with regard to money expenditures.

[19] However, Williams and Donath (1994) estimate that time costs of two simultaneous activities should each be given a weight of one half. See also section 2.2.2.

[20] Of course, monetizing time, as briefly discussed above, relies also on these time use measures.

will be used in individual level multiple regression analysis with media consumption as an independent (and sometimes also as dependent) variable, and that the goal of these estimations is to asses marginal effects of media consumption on subjective well-being and behavior.

Electronic measurement

The most detailed data are obtained using electronic measurement devices. In the case of TV, these are the so-called people-meters. These devices register TV set status (i.e., if the TV is switched on and which channel is it tuned into) and the presence of viewers in front of the TV set. Households participating in the study are equipped with a special remote control upon which each household member must indicate the beginning and end of a viewing session by pushing a button (IP Network 2006, p. 25). Sometimes, an additional quality rating of viewed programs is included (see Gfk Switzerland 2009b). Data are primarily used for TV ratings and the determination of advertising rates. Therefore, samples correspond in most countries to nationally representative long-term panels. Demographic information important for advertisers, like age, sex and income, are recorded as well. Often, electronic measurement is accompanied by regular surveys capturing, for example, lifestyles or purchase behavior of viewers. In Europe, the first people-meter system was launched in 1981 in the UK, and in the US it was introduced in 1987. Today, such measurement systems are employed in most European countries (IP Network 2006, p. 26-27).

Interestingly, electronic audience measurement for radio has a shorter history. It was first introduced in 2001 in Switzerland (Gfk Switzerland 2009a). In the US, the system was introduced in some local radio markets in 2008. The measurement device is a so-called portable people-meter, a wrist watch each panel member is wearing that records sounds and sends them to a server where they are matched with radio programs. Therefore, radio consumption from all sources (standard radio receivers, internet, mobile phones, etc.) is measured and out-of-home radio consumption, e.g. in a restaurant or a taxi, is included as well. Furthermore, active as well as passive radio consumption is recorded. The technique would theoretically also be suitable to measure TV consumption (Gfk Switzerland 2009a). There are also different techniques to electronically measure internet consumption (for a detailed overview see Bermejo 2007).

Although not exactly the same technique is used in all countries, aggregate measures such as average TV watching times are often published and compared across countries (see, e.g., IP

Network 2006). Individual level data are, however, usually not available to independent researchers.

Reliability and validity of people-meter systems and representativeness of samples are often hotly debated. They even become a political or legal issue, because large financial stakes depend on these audience measurements (see, e.g., Syfret 2006; Stelter 2008). These issues also arise because in some countries TV rating agencies are not independent from media owners, especially from public broadcasters (e.g. in Austria or Switzerland) (IP Network 2006, p.28). Scientific studies on data quality or validity are however scarce.[21] Some authors report problems associated with sampling and representativeness or with people, especially children, having difficulties to indicate via the remote when they are watching TV or not (Rubens 1989; Adams 1994). Lamas (2005), however, reports that internal coincidental surveys usually lead to satisfactory results regarding validity. In such surveys, sample members are called by telephone and asked if they are watching TV and which program they are watching. This information is then compared with the household's people-meter information. Coincidental rates are usually between 86 and 95%. Hoogendoorn (2006) argues that reliability depends largely on sample size. The increase in sample size in recent years throughout many countries (IP Network 2006, p. 27) may therefore have benefited reliability.

Time use diaries

Arguably, the most popular measurement technique in time use research relies on so-called time use diaries. Study participants are asked to maintain a diary (on paper, online, by telephone or personal interview) in which they indicate for a 24 hours day all their activities, where they took place and if participants were alone or with someone else. In many studies, participants are also asked about secondary activities ("Did you do anything else at the same time?") and occasionally even about tertiary media consumption ("Was the TV or radio on?"). Researchers then code the reported activities according to a preset scheme. Respondents are mostly required to fill out their diaries for one or two days, often a weekday and weekend day, or sometimes for whole week in order to obtain more precise time use estimates, including irregular tasks. Usually, participants are required to answer additional survey questions about demographics as well as living and working circumstances. However, in an effort to avoid overburdening of study participants, questionnaires are usually kept short. For

[21] On the lack of care for research quality in the rating industry see Rubens (1989).

a more detailed description of usual time diary studies see, e.g., Robinson (1999) or Hamermesh et al. (2005).

Hence, diary studies include all media consumption activities in and out of the house. By now, such time use studies are available for many countries and various years, although such studies mainly cover European or OECD countries. Studies in different countries often differ in their methodology and periods examined and are therefore not always comparable. Two recent initiatives, however, add to the cross-country and over-time comparability of such time use data. HETUS (Harmonised European Time Use Survey) is a European project. In order to enhance comparability, Eurostat publishes detailed guidelines for member states who intend to carry out time use surveys (see Eurostat 2004; 2009). By now, data from 15 European countries beginning in 1998 is available on the HETUS Homepage.[22] Individual level data is, however, not publicly available; access is limited to certain summary statistics. The MTUS (Multinational Time Use Study) project has an even larger scope. Its goal is to harmonize existing time use data collected since the 60s into a single data set. As of this year, it entails 60 data sets from 22 countries, and efforts to incorporate the HETUS and other new data sets are currently underway (see Fisher et al. 2009).

Time use diary studies passed a series of validation exercises. Robinson (1985) reports a high correspondence between diary entries, experience sampling and random hour reports. In the case of experience sampling, study participants are paged at random points in time during the day and asked to write down what they are doing. This information is later compared with their diary entries. The correlation amounts to about 0.7 to 0.8, whereby the discrepancy between the two methods is largely ascribed to the beeper method being less valid as outdoor activities are underreported. In the random hour method, participants of a diary study are asked to describe a random hour of their day in precise detail. Correlation between the two methods is about 0.8. With respect to media consumption, radio listening seems to be underreported in the diary study. Correspondence between spouses' diaries of time spent together is, with about 80 to 85%, also sufficiently high (Juster 1985b; 1986).[23]

Reliability of diary studies seems also to be high. When respondents are asked by interviewers for reports of yesterday or tomorrow (i.e., the respondents are contacted twice)

[22] https://www.testh2.scb.se/tus/tus/default.htm

[23] For a good short overview of validity and other measurement issues see also Juster and Stafford (1991) and Robinson and Godbey (1999, p. 74-77).

the two different types of diaries show a high correspondence (correlation of 0.85). High correspondence is also found between aggregate amounts of time spent on the different activities in different geographical samples within a country and with diary studies with somewhat diverse methodologies (Robinson 1985).

The major drawback of diary studies are the strain they put on respondents and their high cost, and, as is the case with any survey technique, diary studies may be subject to various biases. Time use studies are quite demanding on respondents. Therefore a non-response bias might exist in the form of underrepresentation of busy people (and the overrepresentation of heavy TV viewers). However, this suspicion does not to stand up to empirical examination (Abraham et al. 2006), rather the opposite seems to be the case. Continuing participants in an American time diary study are those working more and watching less TV than those dropping out of the panel (Robinson and Godbey 1999, p. 62-63). Similarly, Abraham et al. (2008) report participants of the American Time Use Survey (ATUS) completing more volunteer work than non-participants (and therefore they may be watching less TV). Another bias that might be relevant for the case of media and especially TV consumption refers to under- or over-reporting due to social desirability. Contrary to expectations, Bechtel et al. (1972) document that families rather over-report their television consumption in TV viewing diaries and survey questions compared to filmed behavior in front of the TV set. It has however to be noted that the sample size in that study was very small and that selection bias is probably very dominant, i.e., families that are very fond of TV are those that tend to participate in such intrusive studies.[24] In any case, social desirability seems to be a rather small issue in diary surveys because the neutral setting of the diary only requires chronological reporting of individual activities (Robinson 1985, p. 40-41; Abraham et al. 2008, p. 4). Other potential biases and problems in diary studies, such as recall bias, capture of seldom performed tasks or of very short-period activities, are probably less of an issue with regard to media consumption (for a discussion of these issues see Robinson 1985).

Surveys

Another very common technique for capturing time spent on the media (and on other activities) is the use of normal survey questions, which is often referred to in time use

[24] Families did not keep actual time use diaries about all their activities, but just indicated in a diary the hours they were watching TV. This might lead to a overestimation in the viewing diary (Robinson and Godbey 1999, p.75-76).

research as “stylized measurement”. Surveys are probably the most diverse tool. Survey questions can capture various aspects of media consumption. For example, they can relate to total consumption of a media type or they can relate to specific functions of media use, like entertainment, information or information about specific elections. In the European Social Survey (ESS), respondents are asked, for example: “On an average weekday, how much time, in total, do you spend watching television?” and “And again on an average weekday, how much of your time watching television is spent watching news or programs about politics and current affairs?“ The same questions are repeated for radio and newspaper consumption. Similarly, in the Swiss Election Studies (SELECTS), respondents are asked to provide the number of days in a week in which they watch the news on TV, listen to the news on the radio, and read the political section of the newspaper. In this case, frequency measures are applied rather than duration, as is the case with the ESS. In contrast, in the Eurobarometer Survey Series, media use questions often relate to more specific media functions: “How often did you watch any television programmes or television news about the European election campaign during the two or three weeks before the election?” (Eurobarometer 31a, see Reif and Melich 1993). Another difference with the above questions from the ESS and from Selects is the reference to a specific time period instead of asking about an average/usual weekday or week. Often, questions also refer to media consumption yesterday, or last week, in order to mitigate recall bias. However, according to Chang and Krosnick (2003) who compare the two question formats in the US National Election Studies (NES), the “typical week” questions yield higher predictive validity than the “past week” questions. For an excellent overview of media use questions formats and questions in international and national surveys see Newton (2002).

Capturing media use with survey questions has many advantages. Positive aspects of survey questions are their ease of use, their cost effectiveness, the possibility to connect them to a wealth of demographic and other information at the individual level because they can be added to any general survey, as well as their comparability between media types and between countries (the latter mainly because some large international surveys include media use questions). However, many researchers worry about the validity and quality of this kind of time use data. Some researchers even conclude that “some form of diary instrument […] is the only valid measurement of time use, and less expensive substitutes are of substantially lower quality and have systematic biases of a major sort” (Juster and Stafford 1991, p. 482). Such statements, however, have to be qualified, because data requirements depend on their intended

use. Newer studies therefore offer a more distinguished treatment of data quality issues (see, e.g., Juster et al. 2003; Kan and Pudney 2008). A major concern relates to the observation that time use estimates elicited through survey questions are generally higher than time use estimates obtained through diaries. Activities add up to substantially more than 168 hours a week. One reason might be that respondents seem to think of the "average day" as the "average day they watch TV" (Robinson and Godbey 1999, p. 59-60). One could actually correct for this bias by asking two questions: "Thinking now of the typical week when you watch TV. On about how many days do you watch?" and "And thinking of the typical day in a week when you do watch TV. For about how many hours do you watch?" (see Newton 2002, p.141).

Another reason for the higher time estimates in surveys might be that people do not differentiate properly between primary and secondary activities, i.e., their reported TV watching time includes primary as well as (a part of) secondary TV consumption (Juster and Stafford 1991, p. 484; Robinson and Godbey 1999, p.59). However, when displaying interest in a certain activity like TV watching (and not in the distribution of total time use), it is not per se clear if only primary time use is the right reference figure. Just asking for average TV consumption might even be advantageous because the respondent is left to decide what he or she classifies as "TV watching" (for a similar argument see also Chang and Krosnick 2003, p. 75). The drawback of this approach however might be that not all people share the same interpretation of "watching TV" and that inter-personal comparability might suffer.

In any case, for multivariate analyses, like studying the relationship between TV consumption and subjective well-being, such biases are only an actual problem if they are systematic with regard to the dependent variable,[25] i.e., if different groups of people are subject to these biases to a different extent. Some researchers conclude that time use estimates from diaries and from stylized questions show similar variation between different groups and that the latter, despite lower accuracy and reliability, therefore offer a suitable ordinal scaling of people's time use (see Kan and Pudney 2008, p. 104-105). Others have found the gap between the two methods to systematically vary with respondents' characteristics (e.g. Robinson 1985; Press and Townsley 1998). For the case of TV watching, Robinson and Godbey (1999, p.152) conclude

[25] Other potential measurement errors that are not systematic, e.g. because respondents do not remember their media consumption correctly (Robinson and Godbey 1999, p. 59), are also not very problematic for multivariate analyses if the ratio of error variance to true variance is sufficiently low. These measurement errors may reduce statistical fit but will not lead to any systematically biased results.

that the two techniques lead to similar average results when diary measures include secondary and tertiary viewing. Kan and Pudney (2008) investigate the nature of the gap between the two techniques for the case of housework by using data from a single source. They conclude that, despite some systematic bias in stylized measurement, most of the measurement error is random and not systematic. The measurement error seems not to be very problematic when time use estimates are used as the dependent variable. Yet, when used as an independent variable, an attenuation bias might occur, i.e., coefficients might be biased towards zero.

Other time use measurement techniques

There exist a few other techniques to measure time use or, specifically, time spent on the media (see also Robinson and Godbey 1999, p. 61-63). They are however seldom used or focus on different goals. The above-mentioned experience sampling method (ESM) or beeper method is one of those techniques. Its focus is, however, mostly on affective states during activities and not on the duration of activities (for ESM and television consumption see Csikszentmihalyi and Kubey 1981; Kubey and Csikszentmihalyi 1990). The day reconstruction method (DRM) of Kahneman et al. (2004a; b) also results in time use measures. It is basically equivalent to the diary method; its focus is, however, on subjective well-being, as well.

Some observational studies do focus directly on time use. On-site spot observations are basically the low-tech equivalent of ESM, where the researcher directly observes the study subject at random points of time. In a few studies, participants are even observed continuously. Such studies are mainly suited for rural communities in developing countries (for a description and evaluation of the method see Nickols and Ayieko 1996). In the case of TV consumption, there exist early "observational" studies where families TV watching was filmed (Allen 1965; Bechtel et al. 1972). Samples are very small, however, and studies are mainly used to validate other measurement techniques.

Summary and evaluation

The above-discussed time use measurement techniques all have their advantages and disadvantages. An evaluation should therefore consider the intended use of the data.

Table 1 summarizes several criteria that are important for time spent on the media and for the empirical applications in chapter 3 and 4 of this thesis.

Table 1: Evaluation of Time Use Measurement Techniques

	Electronic measurement	Time use diaries	Survey questions
Suitable for all media types	TV and radio only	Yes	Yes
Out-of-home consumption included	Radio: usually yes TV: usually no	Yes	Yes
Definition of consumption / secondary consumption included	Left up to the respondent	Separation into primary and secondary consumption	Left up to the respondent
Functions / content of media consumption	Programs watched available	Not available	Partly available, e.g. entertainment and information
Measurement error / bias	Low	Low for regular activities / high for irregular activities	High
Cost	Very high	High	Low
Cross-country comparability	Medium	Medium to high	High
Linked with other individual level information	Some demographic information	Some demographic information	Yes
Data availability	Available for several countries; individual level data not available	Individual level data available for several countries	Individual level data available for many countries

While electronic measurement clearly leads to the most detailed and least biased results, it is only available for TV consumption and to some extent for radio consumption. This prohibits the comparison of all three major media consumption activities, TV, radio and newspaper. Other major drawbacks include the method's high cost and the linkage of the data only to some demographic information at the individual level but not to behavioral or attitudinal variables, which would be needed for an analysis of the effects of media consumption on behavior and well-being. The latter point also applies to time use diaries. The commonly missing separation between different media consumption functions is a second disadvantage of the diary method. On the other hand, its advantages lie in the separation between primary and secondary activities and in its low measurement error and bias. The major advantages of measuring time spent on the media with stylized survey questions are their ease of use, low cost and, primarily, that the data are linked to a wealth of information on individuals'

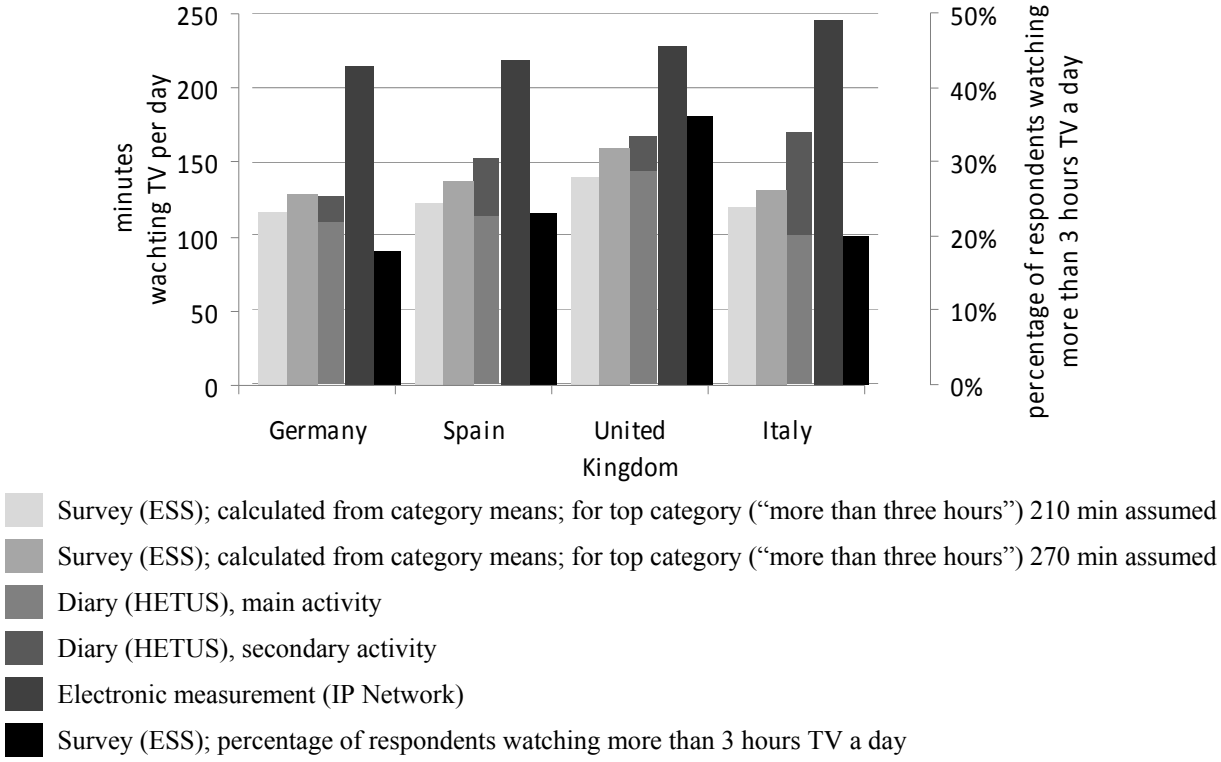
demographic and socio-economic position, on their attitudes, beliefs and stated behaviors, which leads to a much broader field of research. Such research is done at the cost of lower data quality. While it is often hoped that measurement errors are just random and cancel out over large samples, the possibility of systematic biases must be considered and should be discussed with regard to the specific applications of the data.

Robinson and Godbey (1999, p. 152) conclude that, despite their clear methodological differences, the three measurement techniques lead to about the same average TV consumption in the case of US data assembled in the mid-eighties and the mid-nineties. Of course, such a comparison at the country level can only hint at correspondences and disparities between measurement techniques and can not at all provide an indication of potential biases at group or individual level. Nevertheless, Figure 1 compares the average television consumption per day, measured with different methods for the four countries Germany, Spain, the United Kingdom and Italy.

First, survey data from the European Social Survey is used. The survey asks respondents for their TV consumption on an average weekday and answers are coded in eight categories ranging from "no time at all" to "more than three hours". I calculate average TV consumption using category means and weights correcting for oversampling and undersampling of different socio-economic groups. The problem with this calculation is the open-ended category "more than three hours", because a minute value for this category must be assumed. The country averages are therefore calculated twice, once assuming 210 minutes and once assuming 270 minutes. However, the actual category mean could be different for different countries; it might, for example, be higher should more respondents choose this category. Therefore, I also show in Figure 1 the share of respondents choosing the top category. The second data source is the Harmonized European Time Use Survey (HETUS). I use country averages for different activities published on the HETUS homepage. The data distinguishes between TV consumption as primary and as secondary activity. The third country averages come from electronically measured data used by TV rating agencies. They are yearly published by IP Network. All data reflects the years 2000 to 2003.[26]

[26] The ESS data were collected 2002/2003, the IP Network data relate to the year 2002, and the HETUS data correspond to 2000/2001 for the UK, to 2001/2002 for Germany and to 2002/2003 for Italy and Spain. Regarding the data sources see Jowell et al. (2003), HETUS (2008) and IP Network (2004).

Figure 1: Time Spent on TV Consumption: Comparison of Measurement Methods



Data Sources: European Social Survey (Jowell et al. 2003), HETUS (2008), IP Network (2004).

When looking at Figure 1, it is first of all striking that electronic measurement leads to considerably higher average TV consumption than the other methods. This is consistent with the observation of other authors comparing diary and people-meter data (see, e.g., Robinson and Godbey 1999, p. 59). Reasons for the large difference might be that heavy TV viewers are oversampled by the TV rating agencies or that (a part of) tertiary TV consumption is also captured (i.e., when the TV is on, but nobody is watching) despite requiring participants to indicate on the remote control when they are actively watching and when not. However, the ordering of countries according to their average TV consumption is the same using electronically measured data and diary data when primary and secondary viewing from the diary are taken into account.

Survey data and diary data seem to closely correspond with each other when secondary TV consumption is low (Germany, UK). For the UK, where a large part of respondents chose the top category (almost 30%), the higher assumed minute amount for the top category corresponds better with the diary data. For Germany, which has a rather low share of respondents in the top category (about 17%), the choice of value hardly affects the results. The more interesting case, however, arises when secondary TV consumption as indicated in

the time use diaries is high, which is the case in Spain and especially in Italy. Stated average TV consumption from the ESS corresponds neither to primary nor to total primary plus secondary TV consumption from the diary but lies somewhere in between. This result indicates that respondents, when establishing the definition of "TV watching" themselves, include both primary consumption as well as some secondary consumption.

Of course, as said before, such a comparison at the country level with data from different sources can only lead to speculation about the causes of the correspondences and differences between the different measurement techniques. Any further analysis would need individual level data, if possible from a single source. Nevertheless, the above figure shows that, although there are large differences between the methods when looking at levels of TV consumption, the ordering of countries is consistent and differences can be reasonably explained. Hence, when looking at marginal effects of TV consumption on some outcome variable, the choice of measurement method might possibly not affect results substantially.

2.3.3. Other Measures

There also exists a variety of other (broader and cruder) measures for capturing certain aspects of media consumption. The World Bank (several years), for example, publishes the number of newspapers per 1000 people, the percentage of households with a television set or the number of internet users and broadband subscribers per 1000 people in its World Development Indicators; or the UNESCO Institute for Statistics (2008) reports the average circulation of newspapers per 1000 inhabitants. Data usually come from a variety of sources, be it from surveys or from market data. Such penetration or access rates are often used to compare media consumption (or rather media access) over a large sample of countries, including developing countries where more detailed data is not available. These kind of data, however, cannot be used to investigate any matters at the individual level.

2.4. Individual Determinants of Television Consumption

2.4.1. The Amount of Time Spent on Television Consumption

Data from the European Social Survey (ESS)[27] offer a detailed look at the time spent watching TV. The data allow, on the one hand, separating the information function from the entertainment and other functions and, on the other hand, comparing the amount of time spent on television with the amount of time spent on other types of media, specifically on radio and on newspapers. Such comparison helps in appreciating the role of TV in people's lives and to better understand the determinants of TV consumption.

Respondents in the ESS are asked how much time, in total, they spend watching television, listening to the radio and reading the newspapers on an average weekday. They are also asked how much of the time they spend consuming each of the three types of media is devoted to news and programs about politics and current affairs. They can indicate their answer on an 8-point scale ranging from "no time at all" to "more than 3 hours".[28]

The upper part of Figure 2 presents data on people's time spent on the consumption of the three media types covering both entertainment and information for almost 90,000 respondents from 27 European countries from the first two waves of the European Social Survey carried out in 2002/2003 and 2004-2006.[29] To render the analysis less complicated, the eight original time use categories have been combined into five categories ranging from "no time at all" to "more than 2.5 hours".

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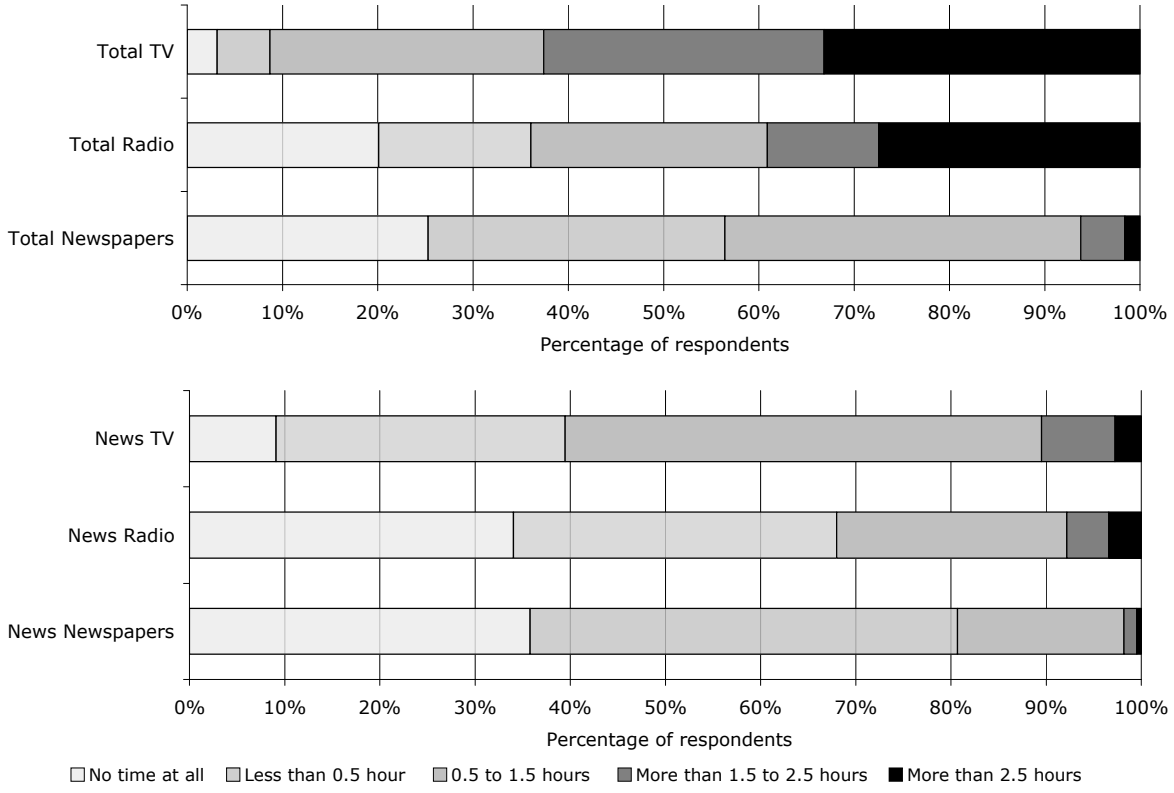
[27] For a general description of the ESS data see Jowell et al. (2003; 2005). The data are archived and distributed by the Norwegian Social Science Data Services (NSD).

[28] For a discussion of the data quality see section 2.3.2. Only analyzing measures of time use and ignoring expenditures, captures, of course, not the full picture of media consumption. However, time costs are supposedly the largest part of the costs of TV consumption. Especially for marginal decisions, monetary expenditures tend to be insignificant. See also the discussion in section 2.2.2.

[29] The two waves cover the various European countries in a somewhat different way: Austria (wave 1-2), Belgium (wave 1-2), Switzerland (wave 1-2), Czech Republic (wave 1-2), Germany (wave 1-2), Denmark (wave 1-2), Estonia (wave 2), Finland (wave 1-2), France (wave 1-2), UK (wave 1-2), Greece (wave 1-2), Hungary (wave 1-2), Ireland (wave 1-2), Israel (wave 1), Island (wave 2), Italy (wave 1), Luxembourg (wave 1-2), Netherlands (wave 1-2), Norway (wave 1-2), Poland (wave 1-2), Portugal (wave 1-2), Spain (wave 1-2), Sweden (wave 1-3), Slovenia (wave 1-2), Slovakia (wave 1-2), Turkey (wave 2), Ukraine (wave 2). Wave 1 was conducted in 2002/2003 and wave 2 in 2004-2006.

Figure 2: Media Use in 27 European Countries, 2002-2006



Data Source: European Social Survey (Jowell et al. 2003; 2005).

The statistics reveal that TV is by far the dominant medium. One-third of the respondents indicate that every day they spend more than two and a half hours in front of the TV set. More than 60% watch TV for more than one and a half hours per day. This represents a large share not only of the leisure time, but also of the total time available per day after subtracting time spent sleeping. In contrast, only 3% do not watch any TV at all. In comparison, listening to the radio is clearly less popular than watching television. While more than one-fourth of the respondents spend more than two and a half hours with this activity, surprisingly enough, more than 20% do not listen to the radio at all. Also, about a quarter of the respondents do not read newspapers at all. Most people (56%) spend less than half an hour reading newspapers and only a small fraction (6%) reads for more than one and a half hours a day.

The lower part of Figure 2 presents data on the time devoted to acquiring news in the various media types. The picture looks different when concentrating on the information function of the different types of media than when looking at total media consumption. TV watching is still the most time consuming activity, but the differences between the three types of media are much smaller. About 10% of respondents watch news programs on TV for more than 1.5

hours a day. About 8% listen to the news on radio and 2% read in the papers for more than 1.5 hours. More than one-third does not use radio and the newspapers for informational purpose, while almost 10% do not watch news on TV.

The data suggest that TV consumption follows different principles than radio or newspaper consumption. Much of television viewing is done for entertainment purposes only, but this does not exclude the fact that the news offered on TV, especially the evening news, are an important source of information. Watching TV is an activity almost everyone undertakes, while a considerable share of the people do not listen to the radio or read newspapers.

2.4.2. The Role of Opportunity Costs of Time

To appreciate the differences in the consumption of the three media the differences in their cost-benefit structure should be taken into account. While marginal benefits of media consumption mostly depend on the quality of content and on how content matches individual preferences, marginal costs almost exclusively consist of opportunity costs of time. This is especially true for TV and radio, where marginal monetary costs are zero (except in the case of pay-per-view TV) and cognitive costs are low as well (Kubey and Csikszentmihalyi 1990). One just has to push a button. In the case of radio, even opportunity costs of time can be very low. One can easily listen to the radio while undertaking another activity, such as cooking, working, or driving a car. To a lesser extent, this is also true for TV. Some people do have their TV set running while undertaking other activities, such as eating or even conversing with friends. In contrast to radio, television requires not only oral but also visual attention. Studies show that about 70% of TV viewing time is exclusively devoted to TV, while the remaining 30% is accompanied by another activity (Robinson and Godbey 1999; Grahn et al. 2003).[30] Newspaper consumption, in contrast, has a different cost structure. Cognitive costs are much higher, and reading the newspaper requires full attention; it is more difficult to do other activities simultaneously. Only during time in which one is forced to do nothing, like commuting with public transportation or sitting in a doctor's waiting room, can reading newspapers be considered a secondary activity. Hence, Ekelund and Watson (1994) explain the decline in newspaper consumption over time with increased opportunity costs of household production due to rising labor force participation.

[30] These percentages cannot directly be compared with data presented in Figure 1 because television consumption as a primary activity can also be accompanied by another secondary activity.

However, recalling the above-discussed media consumption patterns, it seems to be difficult to simply explain the differences between the three media types through time opportunity costs. Thus, watching television is extremely time consuming in comparison with listening to the radio (which more easily allows for simultaneous undertaking of other activities), and should therefore be undertaken less – which is certainly not the case in reality.

Differences in media consumption between persons

To shed more light on the role of opportunity costs of time and other factors in explaining TV consumption, I analyze how these factors are related to TV, radio and newspaper consumption at the individual level. Again, the comparison of the three media types highlights and helps to understand the specific features of TV consumption. In a regression analysis, the different media and news consumption activities are explained by personal characteristics of the consumers controlling for country/wave and time fixed effects. Individual characteristics are used as proxy measures for individual opportunity costs of time, cognitive ability and preferences for entertainment and information. To render the presentation and interpretation of the results easier, I transform the different media use time categories into cardinal numbers representing the minute value of the mid-point of the respective category. For the top category (more than 3 hours) I assume 210 minutes. Respondents watch on average almost two hours TV daily (117 minutes; standard deviation 65), listen 85 minutes to the radio (standard deviation 81), and read 32 minutes in the newspapers (standard deviation 36). Average TV consumption of news and political programs amounts to 45 minutes a day (standard deviation 39), radio news consumption to 30 minutes a day (standard deviation 43), and political newspaper consumption to 18 minutes a day (standard deviation 24).[31]

Table 2 presents the OLS estimates. However, similar results are obtained using ordered probit estimation and the original categorical information on media use (see Table A1 in the Appendix).

[31] These descriptive statistics depend, of course, on the assumed minute amount for the top category and, therefore, the absolute level cannot be interpreted in detail. However, they are useful for analyzing general differences between media types, between countries and between individuals. See also the discussion in section 2.3.

Table 2: Media Consumption and Personal Characteristics

Dependent variable: media use (minutes)	Total TV	Total radio	Total newspapers	News TV	News radio	News newspapers
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Working hours	-0.10** (-7.19)	0.10** (5.36)	0.02** (2.97)	0.01 (0.70)	0.07** (7.03)	0.02** (3.54)
Employment status						
Paid work	Reference group					
Retired	29.21** (37.52)	1.93(*) (1.89)	5.36** (12.42)	10.48** (22.41)	0.79 (1.47)	2.67** (9.18)
Unemployed	26.85** (27.76)	-7.94** (-6.24)	1.96** (3.65)	8.02** (13.80)	-3.50** (-5.26)	0.50 (1.39)
Permanently sick or disabled	32.07** (22.41)	-1.25 (-0.67)	2.81** (3.54)	13.75** (16.02)	2.09* (2.12)	0.52 (0.98)
Housework, looking after children	20.43** (27.45)	-1.15 (-1.17)	1.05* (2.54)	5.85** (13.09)	-0.62 (-1.22)	0.17 (0.61)
In education	-2.93** (-3.01)	-22.26**(-17.39)	0.31 (0.58)	0.51 (0.87)	-7.43**(-11.08)	1.36** (3.73)
Community or military service	0.40 (0.10)	-1.80 (-0.33)	1.48 (0.64)	-0.79 (-0.32)	-4.75(*) (-1.65)	0.62 (0.40)
Education						
Not completed primary education	-10.41** (-9.23)	-15.21**(-10.26)	-11.70**(-18.72)	-5.95** (-8.77)	-3.76** (-4.84)	-5.72**(-13.59)
Primary or first stage of basic education	Reference group					
Lower secondary education	-0.56 (-0.77)	8.24** (8.59)	3.96** (9.78)	0.91* (2.08)	2.06** (4.09)	2.06** (7.56)
Upper secondary education	-9.39**(-12.91)	8.25** (8.63)	6.40** (15.88)	-0.91* (-2.09)	2.64** (5.27)	4.05** (14.90)
Post secondary, non-tertiary education	-15.75**(-14.74)	0.98 (0.70)	6.52** (11.00)	-2.47** (-3.85)	0.58 (0.79)	4.53** (11.35)
1st stage of tertiary education	-28.16**(-32.62)	-9.92** (-8.75)	6.90** (14.43)	-5.23**(-10.09)	-1.46* (-2.46)	6.32** (19.60)
2nd stage of tertiary education	-34.86**(-29.28)	-16.54**(-10.56)	6.10** (9.24)	-9.10**(-12.74)	-2.17** (-2.65)	7.15** (16.07)

Table to be continued

Continuation of Table 2

Household characteristics						
No children living at home	Reference group					
Children living at home	-4.10** (-7.03)	-4.33** (-5.65)	-3.06** (-9.46)	-1.75** (-5.00)	-0.42 (-1.05)	-1.16** (-5.35)
Living without partner	Reference group					
Living with partner	4.28** (8.14)	-3.07** (-4.44)	0.84** (2.90)	2.65** (8.39)	0.49 (1.34)	0.58** (2.98)
Political interest	1.06** (4.28)	3.45** (10.65)	6.72** (49.22)	10.77** (72.77)	7.78** (45.85)	6.86** (74.56)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country/wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	144.81** (30.95)	79.67** (12.94)	-5.06* (-1.96)	2.57 (0.91)	-2.88 (-0.89)	-12.50** (7.14)
No. of observations	89,677	89,584	89,652	89,576	89,214	89,330
R-squared	0.15	0.06	0.15	0.16	0.08	0.16

Notes: OLS regressions. t-values in brackets. Political interest is coded from 0 (low) to 4 (high). Individual controls include variables for household income (log), size of household (square root), sex, age, age squared, area of living, citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for working hours, employment status, children, partner, education, political interest, household income, household size, sex, age, area of living and citizenship are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Source: European Social Survey (Jowell et al. 2003; 2005).

The first three columns of Table 2 present the analysis of total television, radio and newspaper consumption (i.e., information and entertainment). Employment status, as a proxy for opportunity costs of time, is significantly related to watching TV. Respondents active in the labor market watch less TV than retired, unemployed or sick and disabled persons, or persons doing housework and looking after children. Coefficients are large (e.g. retired respondents spend on average almost half an hour more watching TV a day than respondents doing paid work) and statistically significant at the 99% level. The same pattern also applies for newspaper reading. Though coefficients are much smaller than in the case of TV (e.g. retirees read for five minutes more a day than employed persons), they must be interpreted in relation to average newspaper reading time, which is also much lower than average TV viewing time.

The relationship between employment status and radio consumption looks more diverse than for the other types of media, presumably as a result of radio's status as a secondary activity during many tasks. Retired and working people listen more to the radio than all other groups. In many jobs it is possible to have the radio on while working.

The coefficients for the number of working hours tell a similar story. The higher the numbers of working hours are, the less TV respondents watch and the more they listen to the radio. Coefficients are statistically significant but rather small. Ten more hours of working time only translate into one minute less TV or one minute more radio a day. Working hours are positively related to newspaper reading, which would run counter to intuition if working hours only reflected time availability. The coefficient is, however, very small. Newspapers and magazines can also be read during commutes and at the workplace for job purposes.

Education is very strongly and significantly related to all media consumption activities. Respondents with a higher education read more newspapers and watch less TV (with the exception of people without primary education who watch less TV than the reference group). There is no linear relationship between radio consumption and education. At a low educational level, radio listening time increases with education but declines again for people having tertiary education.

Respondents who have children at home consume less of all media types because their free time is probably very precious and scarce. People living with a partner spend more time watching TV and reading newspapers than people without a partner. The latter probably spend less time at home.

Concentrating on news consumption only, the same overall picture emerges. Most coefficients have the same sign and statistical significance but are slightly smaller. This shows that the above-discussed relationships apply to the entertainment as well as to the information function of media. However, some notable exceptions and additional relationships can be found. Respondents in education watch less entertainment TV but the same amount of news TV as respondents active in the labor market. Students certainly have on average high opportunity costs of time and therefore a low demand for (entertainment) TV. However, they seem to get rather high benefits from news consumption. Similarly, (high) education is a very strong predictor of (low) total TV consumption, while this is much less so for news TV consumption. While coefficients are still negative and statistically significant, they are much smaller. In comparison with an individual who has only a primary education, a person with tertiary education watches, in total, more than half an hour less TV a day but only 9 minutes less news TV. As expected, political interest, as an indicator for strong preferences for political information, is significantly positively related to all news consumption activities. Coefficients for total media consumption are, however, much smaller.

The R-squared shows that between 6 and 16% of the variance in the different media consumption activities can be explained by the factors included in the regressions. Explanatory power is higher for TV and newspapers than for radio, and slightly higher for information than for total media consumption. While such a rather low R-squared is usual in individual level regression, it still reflects the fact that many other factors than the ones considered determine the amount of time people spend on the different media consumption activities. Clearly, consumption choice is also reliant upon an individual's personal interests and the content offered by TV, radio and newspapers – or in economic terms, people's preferences and the match between their preferences and media supply. Here, these factors cannot be measured directly.

2.5. Institutional Determinants of Television Consumption

The previous chapter has shown that differences in opportunity costs of time and in other personal characteristics may explain some of the variation in TV consumption between individuals. Individual choice, however, takes place in a certain institutional environment.[32] For example, the concentration of media markets, state ownership of media outlets, or regulatory interventions in the media market presumably determine media supply and affect the quality of media content as well as the expected benefit for consumers. Hence, such institutions play an important role in determining and constraining individual's media consumption choice.[33] In this chapter, the role of institutional settings for individual TV consumption choice is exemplified in an analysis of the effects of the prevalence and regulation of public broadcasters. The empirical results reveal that television consumption – both in total and with regard to news and information only – is lower when state ownership is higher, when public service broadcasters are less independent from government and when they largely depend on government finances.

The remainder of the chapter proceeds as follows. In section 2.5.1, I discuss the related literature and concrete research questions, in section 2.5.2, I present the data and empirical specification and in section 2.5.3, the empirical results. Section 2.5.4 concludes.

2.5.1. Related Literature and Research Questions

The effect of media market characteristics and media institutions on consumers seems not to be clear – neither with regard to theory (see, e.g., Anderson and Coate 2005; George 2007) nor with regard to empirical results. Based on US data, George (2007) shows that the variety of newspaper content increases and that per capita circulation of newspapers is not reduced with higher concentration in newspaper markets. Hosp (2005) presents a contrary finding. He shows that newspaper reading time in Swiss counties with higher concentration in the

[32] Institutions can be broadly understood as law, formal and informal rules and procedures, social norms and traditions or organizations (North 1990).

[33] Furthermore, benefits of media consumption might also depend on political institutions. Benz and Stutzer (2004), for example, show that people in Swiss cantons with more extensive direct democratic rights are better informed than people in cantons with less of such rights. Similarly, people in EU countries where referendums on the introduction of the EURO took place are better informed about related issues than people in countries without a referendum. In sum, when people have a larger say in politics it pays off to acquire information. In the following, we focus, however, on differences in media institutions and not political institutions.

newspaper market is lower than in counties with a more diverse newspaper supply. The author relates this finding to lower quality expectations by the readers in concentrated markets.

State involvement in media markets is yet another highly debated aspect of media institutions. Regulation of media markets – especially of television markets – and public ownership of broadcasters are prevalent in many countries. Intervention in media markets is usually justified by market failures and public good or merit good aspects of information (see, e.g., Sunstein 2000; Kiefer 2003; Hargreaves Heap 2005) and should therefore be beneficial for consumers. Theories in the realm of public choice and political economy, however, emphasize the negative aspects of this kind of state involvement. Independent and free media are regarded as crucial for the political, social and economic development of countries (see, e.g., Brunetti and Weder 2003; Djankov et al. 2003; Strömberg 2004b; Gentzkow 2006; Gentzkow et al. 2006). Specifically, Besley and Prat (2006) show in a theoretical model that independent media ownership reduces media capture by government. Moreover, public broadcasters might lack sufficient incentives to fulfill the public's preferences because they are less subject to competition. Both aspects – political influence and lower incentive to consider the public's preferences – will lead to lower quality expectations by consumers, who will in turn tend to switch to other kinds media that better reflect the consumer's preferences. Ultimately, whether public broadcasting is beneficial for consumers is an empirical question.[34]

In a cross section of 13 countries, Leeson (2008), for example, finds that newspaper and radio news consumption are lower where media freedom is restricted. Interestingly, no corresponding statistically significant effect for TV news consumption is found. The results of Djankov et al. (2003) lead in the same direction, although the authors do not directly analyze media consumption. They show that state ownership of the press is negatively associated with various beneficial social and economic outcomes, while this is much less the case for state ownership of television. Thus, the question arises whether TV consumption merely follows different principles than the consumption of other media types does, or if general measures of media freedom and state ownership do not consistently capture the relevant aspect governing television markets and, therefore, the aspect affecting television consumption choice. Hence,

[34] Consumer sovereignty might not be the only criteria when judging media institutions. This issue is discussed in section 2.5.4.

it might not be possible to empirically capture the effects of state involvement in TV markets when analyzing a large sample of heterogeneous countries where different forms of state ownership are lumped together.

The following empirical analysis is therefore restricted to European countries where state ownership in the form of public broadcasting is eminent but where the extent or importance of public broadcasters varies. I analyze if relative TV consumption is lower (and relative newspaper and radio consumption higher) when state involvement in television markets is higher. Moreover, different aspects of state involvement can be distinguished. A first important aspect is the extent of state ownership of TV stations or the existence of so called public service broadcasters. I expect relative TV consumption to be lower when the share of public TV channels in a country is higher. Second, the independence of these public TV stations depends on the type of regulation and financing. While in some countries the regulatory authority lies directly within a ministry, in other countries a separate regulatory authority exists or public broadcasters are subject to self-regulation. Income of public broadcasters can be broadly separated into income from public sources (license fees, direct government subsidies) and income from private or commercial sources (advertising, sponsoring). An increased share of commercial income of a public TV station results in increased independence from politics and greater exposure to competition from private television. I therefore hypothesize that the relationship between the existence of public TV and television consumption is weaker when the regulatory bond between public broadcasters and government is looser and the share of commercial finance of public broadcasters is higher.

2.5.2. Data and Empirical Specification

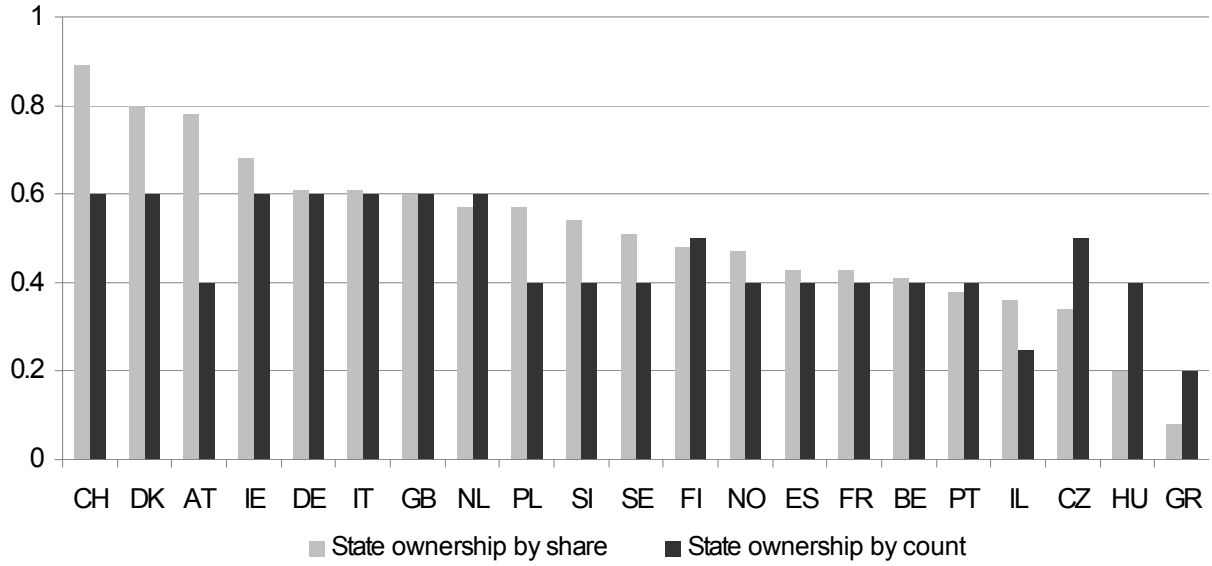
Data on state ownership of television

I use data compiled by Djankov et al. (2003) on state and private ownership of a country's five most important TV stations with local news content. TV stations are selected on the basis of market share of the audience and classified as either state or private owned.[35] TV stations financed by government license fees and accountable to the government or a government

[35] There is also a third category "other", which includes, for example, media outlets owned by political opposition parties. This category is irrelevant, however, for our sample of European countries. Only Slovenia has a TV station in this category with a market share of 1%.

appointed body, like the British BBC, (i.e., public service broadcasters) are classified as state owned. In our sample of mostly Western European countries, this is the dominant form of state ownership. Ownership data are for the year 1999.[36] I combine this country level data with individual level data on media consumption from the first wave of the European Social Survey conducted in 2002/2003. The combination of the two data sources results in availability of data for 21 countries. Figure 3 presents the indicators for the share of state owned TV stations for these 21 countries.

Figure 3: State Ownership of Television in 21 European Countries, 1999



Data Source: Djankov et al. (2003).

The light gray columns represent the share of the five top TV stations that are state owned, whereby the TV stations are weighted by their market share. The darker columns show, for comparison, the unweighted share of state owned TV stations. State ownership is highest in Switzerland. Government controls three of the five most important TV stations and weighted by market share, state ownership amounts to 89%. On the other side of the graph is Greece, where the government controls only one of the top five TV stations with a market share of just 8%. The fraction of state ownership by market share amounts on average to 0.51 with a standard deviation of 0.19. State ownership by share and state ownership by count differ to some extent in some countries. In Austria and Poland, for example, the government controls the more popular TV stations and state ownership by market share is higher than by simple

[36] For further details on the methodology see Djankov et al. (2003).

count. In other countries, like the Czech Republic or Hungary, the opposite seems to be the case. In the following empirical analysis, I concentrate on state ownership by market share as it is the more precise measure.[37] However, in a sensitivity analysis, results are checked using the data on state ownership by count.

Data on regulation and financing of public broadcasters

Public service broadcasters are financed and regulated differently in different countries. Data gathered by Svendsen (2002) account for such differences in regulation. Svendsen differentiates between subordination of public service broadcasters to a ministry, to a separate regulatory authority or to self-regulation. TV stations subject to self-regulation or a separate regulatory authority might be much less susceptible to government influence than TV stations regulated directly by a ministry and thus might be more credible and more able to attract viewers. On the other hand, it might be argued that a ministry is better able to account for public good aspects in information provision and is therefore better able to supply attractive news (but perhaps provides less attractive entertainment). In our sample of 21 countries, 8 countries are regulated by a ministry, 8 are regulated by a separate regulatory authority and 5 countries are subject to self-regulation.[38] For one country, Slovenia, there is no data available.

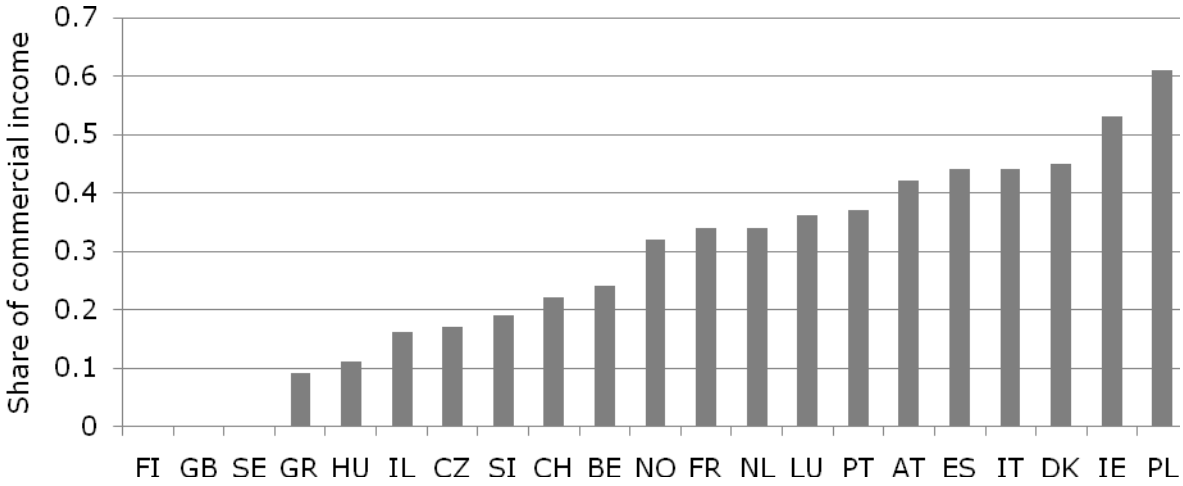
Similar arguments may be put forward with regard to the source of revenue of public broadcasters. I differentiate between public and commercial revenue, i.e., revenue from government grants or license fees and revenue from advertising and sponsoring. The data are calculated from information provided by Betzel (2003) and relate to the year 2002. There is no data available for Germany. Figure 4 presents the share of commercial income of the

[37] It can of course be argued that this measure – state ownership by market share – is to some extent endogenous and already a equilibrium, i.e. the result of the interaction between (public and private) supply and demand (suspect to quality expectations of the public).

[38] Belgium is divided into a French and a Dutch speaking part, as both language groups have their own public service broadcasters that are regulated differently. For the UK, we use the regulation of the BBC for the whole country (ITV is regulated differently) and for Spain the regulation of national public service broadcasters (Catalan public service broadcasters are regulated differently).

public service broadcasters[39] in the different countries. It ranges from 0 to 0.6. The mean is 0.28 and the median 0.32.

Figure 4: Share of Commercial Income of Public Broadcasters in 20 European Countries



Data Source: Betzel (2003).

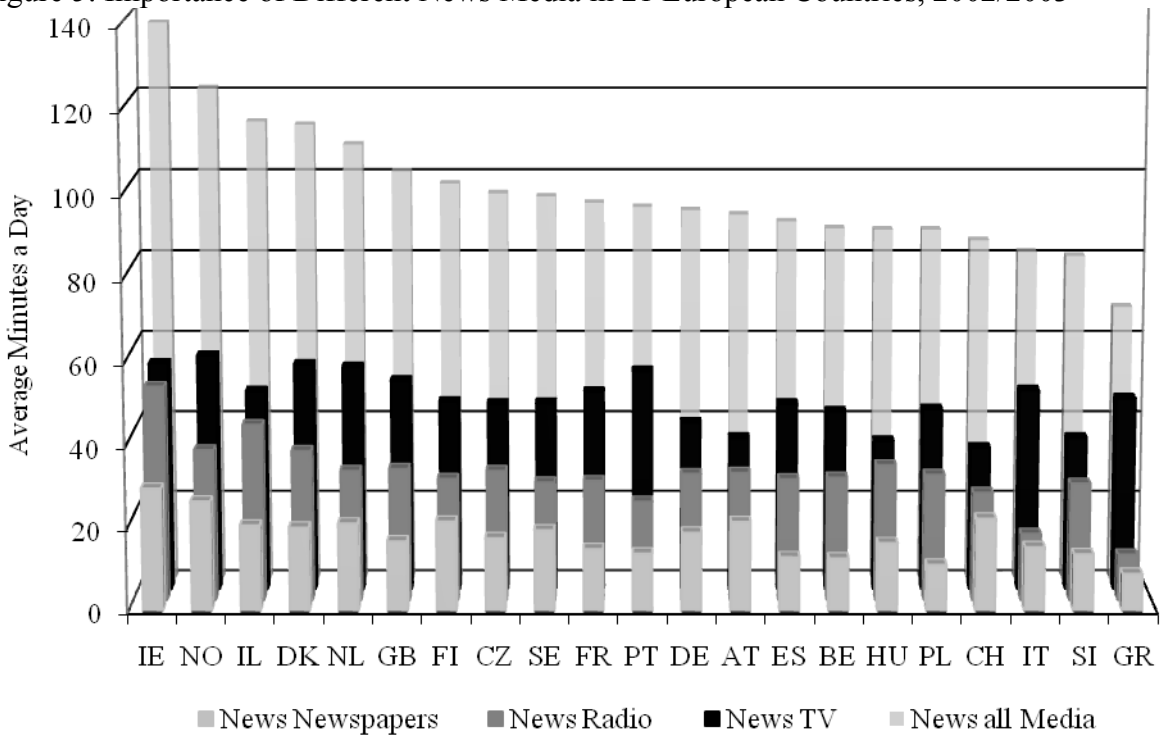
Data on media consumption

In the European Social Survey, respondents are asked how much time they spend watching television, listening to the radio, and reading the newspapers on an average weekday, in total, as well as solely on news or programs about politics and current affairs. They may indicate their answer in eight categories ranging from "no time at all" to "more than 3 hours".[40] To facilitate the analysis, the minute values of the category means are used. For the top category "more than 3 hours", 3.5 hours are assumed. The choice of value hardly affects results. In a sensitivity analysis, I also present ordered probit regressions using the original categorical information.

[39] For some countries, the data are not provided separately for public TV and public radio companies. In these cases, the data presented here relate to both public TV and public radio. For some countries, it was not evident in the data source if the data relates to public TV only or to both public TV and public radio.

[40] For a general discussion of the data quality see section 2.3.

Figure 5: Importance of Different News Media in 21 European Countries, 2002/2003



Data Source: European Social Survey (Jowell et al. 2003).
Note: Average minutes a day are calculated from category means. For the top category (more than 3 hours) 3.5 hours are assumed.

Figure 5 shows the average minutes a day respondents spend on the media for informational purpose in the years 2002/2003 for each of the 21 countries. The countries are ordered according to the amount of total news media consumption (i.e., TV, radio and newspaper consumption added together). In Greece, Slovenia and Italy, total news consumption is the lowest. In Greece, respondents spend on average only a bit more than an hour on news media consumption, whereby three quarters of the time is spent on television (47 minutes). On the other hand, average news consumption is highest in Ireland (2.25 hours) and Norway (2 hours). Other Northern European countries, like Denmark (1.9 hours) and Finland (1.6 hours), also exhibit a high level of media consumption.

In most countries, TV is the most important source of information – evaluated on the basis of time spent on it – followed by radio and newspapers. However, the figure also reveals very different patterns of media use in the different countries. There are countries where one of the media types is more dominant than in other countries. In Greece and Italy, for example, newspapers are as important as radio, and in Ireland and Hungary radio is almost as important as TV.

Empirical specification

Based on the data described above, an econometric media consumption function is specified. The time spent on media consumption MC_i of individual i depends on the extent of state ownership of television stations $StateTV_j$ in country j, as well as on individual characteristics X_i and country-specific variables Y_j.

$$MC_i = \beta_0 + \beta_1 StateTV_j + \gamma_1 X_i + \gamma_2 Y_j + \varepsilon_i$$

I look at both total media consumption and media consumption of news and political affairs. I analyze television, radio and newspaper consumption separately while controlling for the other two media consumption activities, respectively. The other individual control variables include socio-demographic characteristics that are used as indicators for preferences, opportunity costs of time and cognitive ability and presumably affect media consumption choice. These are political interest, working hours, household income (log), household size (square root), age, age squared, gender, marital status, children, employment status, education, citizenship and type of community respondents live in. All individual control variables are from the ESS as well. As state ownership of TV stations is available at the country level only, no country-fixed effects can be included within the regression. To nevertheless control for general differences between countries and their economic situations, GNI per capita adjusted for purchasing power, the unemployment rate and the size of the population are added to the regression. The data are from World Development Indicators (World Bank several years) and Penn World tables 6.2 (Heston et al. 2006). State ownership of TV stations in a country might reflect a more general attitude or a propensity towards state involvement in the economy, which might correlate with individual political involvement and, thus, news consumption. I therefore control for this propensity by including an index for state owned enterprises and government investments constructed by the Economic Freedom Network (Gwartney et al. 2007). Standard errors are clustered at the country level.

A further specification contains the more detailed regulation data. Here, the effect of state ownership of TV stations on media consumption additionally depends on the type of regulation public service broadcasters are subjected to. Three regulatory regimes can be distinguished. Self-regulation forms the reference group, while dummy variables for regulation by a separate regulatory authority $RegAuth_j$ and regulation by a ministry $RegMin_j$ in

country j and their interaction with the share of state owned TV ($StateTV_j$*$RegAuth_j$, $StateTV_j$*$RegMin_j$) are added to the regression.

$$MC_i = \beta_0 + \beta_1 StateTV_j + \beta_2 RegAuth_j + \beta_3 RegMin_j + \beta_4 StateTV_j*RegAuth_j + \beta_5 StateTV_j*RegMin_j + \gamma_1 X_i + \gamma_2 Y_j + \varepsilon_i$$

A third specification adds the share of commercial income of public service broadcasters $ComInc_j$ as well as its interaction with the share of state owned TV $StateTV_j$*$ComInc_j$. Control variables are the same as in the first specification.

$$MC_i = \beta_0 + \beta_1 StateTV_j + \beta_2 ComInc_j + \beta_3 StateTV_j*ComInc_j + \gamma_1 X_i + \gamma_2 Y_j + \varepsilon_i$$

2.5.3. Results

State ownership and absolute media consumption

Table 3 presents the results of state ownership of TV stations by market share on total media consumption. The first column shows that respondents in countries with a higher share of state ownership watch statistically significantly less TV than in countries with lower state ownership ($p \leq 0.01$). The size of the coefficient is considerable (-55). State ownership of TV is not significantly associated with radio and newspaper consumption in a statistically significant manner (column 2 and 3). Coefficients are however positive, i.e., point in the expected direction. The different media consumption activities are positively related to each other. All coefficients are statistically significant ($p \leq 0.01$), however small in size. TV consumption is higher in countries with a higher GNI per capita, a larger population and a higher level of state owned enterprises and government investment. Radio consumption is negatively associated with GNI per capita.

Table 3: State Ownership of TV and Media Consumption

Dependent variable: media use (minutes)	Total TV		Total radio		Total newspapers	
	Coefficient	(t-value)	Coefficient	(t-value)	Coefficient	(t-value)
State ownership of TV	-55.01**	(-4.10)	26.71	(1.46)	11.27	(1.09)
Total TV consumption			0.05**	(3.53)	0.04**	(3.86)
Total radio consumption	0.03**	(3.56)			0.03**	(4.47)
Total newspaper consumption	0.12**	(5.08)	0.19**	(5.19)		
GNI per capita (1000 int. $)	0.56*	(2.60)	-1.17*	(2.28)	0.17	(0.53)
Unemployment rate	59.08	(1.19)	-60.97	(-0.85)	-40.79	(-1.05)
Population (1 Mio.)	0.17(*)	(1.92)	-0.00	(-0.00)	-0.08	(1.72)
State owned enterprise index	3.73**	(4.48)	0.93	(1.06)	-0.33	(-0.54)
Individual controls	Yes		Yes		Yes	
Constant	131.16**	(11.21)	68.36**	(3.06)	-18.28	(1.47)
No. of observations	40,568		40,568		40,865	
R-squared	0.14		0.04		0.14	

Notes: OLS regressions with robust standard errors clustered at country level. t-values in brackets. Individual controls include variables for political interest, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007).

Turning to the analysis of consumption of news and political content in the different types of media in Table 4, the same overall picture emerges. State ownership of TV is negatively related to TV consumption and coefficients are statistically significant ($p \leq 0.05$). Coefficients in the news radio and newspaper regressions are positive but not statistically significant. The size of the coefficient in the TV news regression, which is again substantial with -19, shows that news TV consumption is proportionally reduced to the same extent than total TV consumption when state ownership is higher. For example, a 50 percentage point higher share of state ownership (i.e., the difference between Hungary and Ireland or between Portugal and Switzerland) is associated with about 28 minutes less total TV watching per day (compared to a mean of almost 2 hours) and about 10 minutes less TV news watching (compared to a mean of about 45 minutes).

Table 4: State Ownership of TV and News Consumption

Dependent variable: media use (minutes)	News TV		News radio		News newspapers	
	Coefficient	(t-value)	Coefficient	(t-value)	Coefficient	(t-value)
State ownership of TV	-19.10*	(-2.31)	16.71	(1.28)	4.52	(1.13)
News TV consumption			0.17**	(6.21)	0.10**	(4.98)
News radio consumption	0.12**	(7.41)			0.07**	(4.79)
News newspaper consumption	0.25**	(7.90)	0.26**	(6.83)		
GNI per capita (1000 int. $)	0.68*	(2.45)	-0.24	(-1.05)	0.13	(0.88)
Unemployment rate	85.01(*)	(1.91)	4.69	(0.13)	-15.99	(-0.84)
Population (1 Mio.)	-0.07	(-1.04)	-0.05	(-1.09)	-0.05*	(-2.33)
State owned enterprise index	0.80*	(2.53)	-0.78	(-0.85)	0.09	(0.27)
Individual controls	Yes		Yes		Yes	
Constant	1.33	(0.10)	-6.07	(-0.51)	-16.98**	(2.96)
No. of observations	40,285		40.285		40.285	
R-squared	0.19		0.10		0.20	

Notes: OLS regressions with robust standard errors clustered at country level. t-values in brackets. Individual controls include variables for political interest, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007).

State Ownership and Relative Media Consumption

Absolute media and news consumption might differ between countries due to various reasons. For example, people inform themselves more when they have a larger say in politics (Benz and Stutzer 2004). In order to exclude such factors not explicitly controlled for that possibly explain cross-country differences in the level of media consumption, I analyze whether state ownership of TV is associated with different media consumption patterns, i.e., I look at the relative importance of different media types. Table 5 presents the results for total media consumption, i.e., entertainment and information.

Table 5: State Ownership of TV and Relative Media Consumption

Dependent variable: relative media use (share)	Rel. TV	Rel. radio	Rel. newspapers
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
State ownership of TV	-0.23** (-4.84)	0.15** (4.00)	0.08(*) (1.83)
GNI per capita (1000 int. $)	3e-3(*) (1.91)	-4e-3** (-2.90)	1e-3 (0.89)
Unemployment rate	0.41 (1.45)	-0.26 (-1.34)	-0.16 (-0.90)
Population (1 Mio.)	6e-4 (1.62)	-1e-4 (-0.35)	-4e-4* (-2.49)
State owned enterprise index	0.01** (3.21)	-0.003 (-1.32)	-0.005**(-3.17)
Individual controls	Yes	Yes	Yes
Constant	0.72** (8.70)	0.31** (5.12)	-0.04 (-0.78)
No. of observations	40,398	40,398	40,393
R-squared	0.10	0.05	0.12

Notes: OLS regressions with robust standard errors clustered at country level. t-values in brackets. Individual controls include variables for political interest, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007).

The dependent variable in the first column is total TV consumption divided by total media consumption (total TV plus total radio plus total newspaper consumption). In the second and third column, the dependent variables are total radio consumption and total newspaper consumption divided by total media consumption. The results show that relative TV consumption is much lower and relative radio and newspaper consumptions are much higher when state ownership of TV stations is higher. The coefficients for TV and radio are statistically significant at the 99% level and the coefficient for newspapers at the 90% level. For example, a 50 percentage point increase in the share of state ownership is associated with a 12 percentage point decrease in the share of TV consumption, an 8 percentage point increase in the share of radio consumption and a 4 percentage point increase in the share of newspaper consumption.

Table 6: State Ownership of TV and Relative News Consumption

Dependent variable: relative media use (share)	Rel. news TV		Rel. news radio		Rel. news newspapers	
	Coefficient	(t-value)	Coefficient	(t-value)	Coefficient	(t-value)
State ownership of TV	-0.26**	(2.91)	0.19*	(2.61)	0.07	(1.53)
GNI per capita (1000 int. $)	3e-3	(1.41)	4e-3*	(2.16)	2e-4	(0.13)
Unemployment rate	0.63	(1.42)	-0.30	(-1.07)	-0.33	(-1.30)
Population (1 Mio.)	3e-4	(0.46)	1e-6	(0.00)	2e-4	(-0.89)
State owned enterprise index	0.01(*)	(1.86)	-0.01(*)	(-1.77)	-0.002	(-1.07)
Individual controls	Yes		Yes		Yes	
Constant	0.68**	(5.32)	0.27**	(3.07)	0.05	(0.86)
No. of observations	38,726		38.726		38.726	
R-squared	0.10		0.03		0.09	

Notes: OLS regressions with robust standard errors clustered at country level. t-values in brackets. Individual controls include variables for political interest, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007).

The results look very similar when concentrating on news consumption only (Table 6). Relative TV news consumption (i.e., TV news consumption divided by total news consumption on TV, on radio and in newspapers) is 13 percentage points lower, relative radio news consumption 10 percentage points higher and relative newspaper news consumption 4 percentage points higher when state ownership of TV stations is 50 percentage points higher. However, the coefficient in the relative newspaper news regression is not statistically significant at conventional levels (t=1.53). In sum, the results on relative media consumption confirm the results on absolute media consumption.

Regulation of Public Service Broadcasters

Here, I examine whether the effect of state ownership of TV stations on TV consumption is related to the type of regulation these stations are subject to.

Table 7: State Ownership of TV, Regulatory Authority and TV Consumption

Dependent variable: media use (minutes)	TV consumption	TV news consumption
	Coefficient (t-value)	Coefficient (t-value)
State ownership of TV	45.23** (3.36)	24.25** (4.14)
Self-regulation	Reference group	
Separate regulatory authority	58.97** (6.10)	18.73** (3.97)
Regulation by a ministry	62.72** (5.48)	48.93** (8.66)
State ownership * reg. authority	-105.68** (-6.72)	-31.56** (-4.33)
State ownership * reg. by ministry	-118.30** (-7.37)	-79.42** (-9.77)
Individual controls	Yes	Yes
Controls at country level	Yes	Yes
Constant	0.68** (5.32)	-26.11* (-2.20)
No. of observations	39,060	39,010
R-squared	0.15	0.17

Notes: OLS regressions with robust standard errors clustered at country level. t-values in brackets. Individual controls include variables for political interest, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well. Controls at country level include GNI per capita, unemployment rate, size of population and a state owned enterprise index.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Source: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), Svendsen (2002), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007).

The results in the first column of Table 7 reveal that state ownership of TV stations is only negatively associated with total television consumption if public service broadcasters are regulated by a separate authority or by a ministry. If public service broadcasters are subject to self-regulation, a higher share of state owned TV stations is even positively related to TV consumption. A 50 percentage point increase in the share of state owned TV stations is related to a 23 minute increase in TV viewing per day when public TV channels are subject to self-regulation and to a 30 or 36 minute decrease in TV viewing per day when these channels are regulated by a separate authority or a ministry.[41]

[41] The marginal effects of state ownership in the case of regulation by a separate authority or a ministry have to be calculated from the coefficients of the dummy variables and the interaction effects. The respective t-values are 6.9 and 6.7. Both marginal effects are therefore highly statistically significant ($p<0.01$).

Focusing on TV news consumption, similar results are obtained. They are shown in the second column of Table 7. A 50 percentage point increase of state ownership is associated with a 22 minute increase in TV news consumption if public service broadcasters are self-regulated and a 28 minute decrease if a ministry regulates these TV channels (t=-7.5). If a separate authority regulates the public TV channels, there is no statistically significant relationship between the share of state ownership and TV news consumption (t=1.5).

Financing of Public Service Broadcasters

The effect of state ownership of TV stations on TV consumption might depend not only on the type of regulation and control that public stations face, but also on the origin of their financing. Table 8 shows the results of the regressions, including the share of commercial income of public service broadcasters and its interaction with the share of state owned TV stations.

Table 8: State Ownership of TV, Financing of TV Stations and TV Consumption

Dependent variable: media use (minutes)	TV consumption	TV news consumption
	Coefficient (t-value)	Coefficient (t-value)
State ownership of TV	-96.18** (-5.36)	-23.88(*) (-1.94)
Share of commercial income	-83.38* (-2.44)	24.84 (0.86)
State ownership * commercial income	182.41* (2.79)	-12.28 (-0.24)
Individual controls	Yes	Yes
Controls at country level	Yes	Yes
Constant	188.98** (10.18)	5.14 (0.37)
No. of observations	37,652	37,374
R-squared	0.15	0.19

Notes: OLS regressions with robust standard errors clustered at country level. t-values in brackets. Individual controls include variables for political interest, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. A dummy variable for the highest income category and dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well. Controls at country level include GNI per capita, unemployment rate, size of population and a state owned enterprise index.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Source: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), Betzel (2003), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007).

When public TV stations receive all their income from public sources (e.g. through license fees or government grants), state ownership is negatively associated with total TV consumption. A 50 percentage point increase in the share of state owned TV stations is then related to 48 minutes less TV watching per day. The effect is statistically significant ($p \leq 0.01$). As the share of commercial income increases, this relationship becomes smaller. At 30% of commercial income, an increase in the share of state owned TV stations by 50 percentage points is linked to a decrease in TV consumption of only 20 minutes. At 60% of commercial income (which is the maximum in our sample), the relationship is even positive, though not statistically significant.

The picture appears different for TV news consumption. As shown before, state ownership is negatively related to TV news consumption. This relationship does not depend on the level of commercial income. Both, the coefficient for commercial income and the coefficient of the interaction effect are not statistically significant at conventional levels. In countries where public TV stations rely on a high share of commercial income, entertainment, but not information, on TV seems to be more attractive than in countries with a share of public income. Yet, there also seems to be no trade-off between entertainment and information when public TV stations have a higher share of commercial income. News and information on TV retain the same attractiveness.

Robustness

The results presented thus far are robust to various changes in specification. Table A2 in the appendix shows the result of these specifications for absolute total TV and absolute news TV consumption.

All results[42] are confirmed using ordered probit regressions and the original categorical information on television, radio and newspaper consumption.

Using the share of state owned TV stations by count, i.e., the unweighted share of state owned TV stations among the five top TV stations in a country, instead of the share of state owned TV stations weighted by market share leads to very similar results as well. Coefficients are generally bigger, which is not surprising as the variation of state ownership by count is smaller than the variation of state ownership by share. An increase in state ownership by

[42] Relative media consumption cannot be calculated using the original categorical information. Therefore, those results cannot be checked with ordered probit regressions.

count of 20 percentage points, which again reflects the difference between Hungary and Ireland or between Portugal and Switzerland, is associated with about 18 minutes less total TV consumption and about 7 minutes less TV news consumption. This is similar to the reduction of 28 and 10 minutes when analyzing the effect of state ownership by market share.

State ownership of TV stations might be correlated with other TV and media supply characteristics in a country that systematically influence media consumption. I control for such issues by adding the number of TV channels received by 70% of the population. Again, the results are robust to the added control variable. In column (D), I additionally include the number of radio channels available and the number of daily newspaper titles in a country. Again, the results remain very similar. The only change occurs with relative news TV consumption, where the statistical significance drops slightly below conventional levels ($p=0.11$) (regression not shown in Table A2). This reduction in statistical significance can be explained by the reduced number of observations due to the availability of additional control variables for 17 countries only.

Furthermore, I review whether the results are not driven by one specific country. I therefore repeat all regressions, always omitting the observations of one country (results not shown in Table A2). Generally, the results remain similar and statistically significant at conventional levels. However, omitting the observations from Switzerland (the country with the highest share of state ownership and the lowest average TV consumption) reduces the size of the coefficients, especially for news TV consumption. The coefficient drops from -19 in the baseline regression to -8, but remains statistically significant ($p\leq0.05$). In the case of relative news TV consumption, statistical significance drops slightly ($p\leq0.1$). Omitting observations from Greece or Slovenia – countries with on average high TV consumptions and low state ownership of TV stations – leads to similar coefficients, but in the case of absolute news TV consumption, it leads to a slight drop in statistical significance ($p\leq0.1$). In the case of relative news TV consumption, omitting observations from Greece leads to a level of statistical significance slightly below conventional levels ($t=-1.61$). Yet, in sum, the empirical results are robust to the various changes in empirical specifications.

Direction of causality

So far, the results are consistent with the hypothesis that state ownership and tight control of TV stations lead to a less attractive TV offering – either because public service broadcasters are less subject to competition and therefore must cater less to the public's tastes or because

political influence leads the public to trust TV less (see Connolly and Hargreaves Heap 2007) – and to less TV consumption. The cross-sectional results, however, do not allow for a definitive assessment of a causal relationship. For example, an omitted variable bias might occur, or reverse causation might be possible. The extent of state ownership of television or of public service broadcasting is not completely exogenous and might even depend on media consumption. In countries where no attractive private TV supply exists and TV consumption is low, political pressure for public service broadcasting might be higher. It must be noted that I control for some variables which might drive such a relationship. In smaller countries, for example, availability of private (national) news of good quality might be too costly, thus leading to increased political demand for public service broadcasting. Size of population is controlled, however, in all regressions. Furthermore, public service broadcasters have existed for many decades in many countries. The empirical results would then suggest that public service broadcasters are not highly successful in attracting a higher audience.

It may also be argued that the quality of news on public channels is so much higher that, in order to obtain the desired level of news information, people can spend less time watching public news than news offered by private stations, i.e., the productivity of news consumption is higher in the case of public TV. In this case, I would expect that people would tend to turn to other information media in countries where the costs of information on TV are higher, i.e., in countries with little state involvement in TV markets. The empirical results, however, do not confirm such a relative price effect. Rather, the partial correlation between state ownership of television and the consumption of newspaper and radio follows in the opposite direction (but is not statistically significant).

2.5.4. Conclusion

Media consumption, and especially television consumption, varies to a large extent between countries. Different media institutions in different countries can explain some part of this variation. Specifically, the role that state ownership and the regulation of public service broadcasters plays is analyzed here. I show that a higher share of state ownership of television stations and tighter regulation of public service broadcasters are associated with lower TV consumption, both in total and with regard to information and news only. While these empirical relationships are consistent with the view that tightly regulated public television attracts less viewers than private television, the cross-sectional nature of the data does not allow for a definite assessment of the direction of causality.

In any case, whether the (only) goal of public service broadcasters should be to attract higher audiences is debatable. In many countries, public service broadcasters are commissioned for many different tasks, e.g. to support national productions or to provide minorities a media platform. Furthermore, consumer sovereignty might not be the only appropriate criteria when judging a country's media institutions. Because of the external effects of information consumption, especially of information in the political context, other features, such as citizen exposure to diverse points of view, are important as well (see, e.g., Sunstein 2000; Sunstein 2007). The goal of this chapter is, however, not to judge a country's media institutions but to integrate media consumption into a rational choice framework and to illustrate how individual and institutional characteristics influence media consumption. This analysis provides the basis for the following chapters that analyze the effects of television consumption on well-being and behavior.

2.6. Rational Television Consumption?

So far, television consumption has been analyzed on the basis of standard economic theory. Standard theory assumes that individuals make choices in order to maximize their utility in a time-consistent manner that uses all information available to them. The amount of TV watching is therefore the result of the interaction between individual preferences and restrictions, the latter shaped mainly by individual opportunity costs and institutional settings. Accordingly, TV consumption differences between persons and between countries have been associated with differences in preferences, opportunity costs of time, and institutional settings that affect the quality of programs and the match between offered programs and individual tastes.

In standard neoclassical economics, the question of why people watch so much TV can therefore be answered quite easily. Individuals are assumed to engage in this completely voluntary activity because they enjoy it. They derive utility from it and therefore undertake it; this is a clear case of revealed preference. TV offers information, entertainment, and relaxation almost for free. The extensive choice of programs offered by cable and satellite providers caters to a large variety of tastes. Moreover, the cognitive and physical costs of TV viewing are low (Kubey and Csikszentmihalyi 1990: 173). One just has to press a button. In contrast to going to the cinema, the theater or any other outdoor activity, television consumption does not require one to dress appropriately before leaving the house, purchase a ticket or reserve a seat in advance. Unlike other leisure activities, TV viewing does not require coordination with other persons. One can sit alone in front of the TV, while other leisure activities, such as tennis or golf, require a partner with similar time availability and similar preferences. In short, TV viewing offers high immediate marginal benefits at low immediate marginal costs.

Theories and evidence in the field of psychology and economics (see e.g. Frey and Stutzer 2007) challenge the conclusion that TV consumption is completely rational. This literature reports a large number of different deviations – also referred to as anomalies – from standard theory. Two of those deviations from utility maximizing consumption choice result from time inconsistent preferences or self-control problems of people and from people mispredicting future utility. According to these theories, it is precisely the favorable characteristics of television described above that may cause people to fall prey to *excessive* TV watching. One important reason is that many of the negative consequences resulting from TV viewing are not experienced immediately. The effects of lack of sleep, for instance, only arise the next

day, and the consequences of not spending time with family and friends or not studying for an exam take much longer to appear. The trade-off between immediate rewards and future costs often poses a problem. Lack of willpower or self-control problems induce people to abandon their plans or they overlook future negative consequences of their behavior. For example, they watch another episode of their favorite soap instead of going to bed early, seeing friends, or finishing some work.

There exists a large body of literature in psychology on self control and self regulation failure. Hence, in the following, I discuss what can be learned about television consumption directly from psychological literature before reverting to the economic literature that has integrated these psychological concerns within the economic framework. The picture of television consumption would, however, not be complete without referring to the recent economic literature on utility misprediction, which takes place in section 2.6.3. The chapter concludes with a presentation of the literature and the empirical evidence which directly refers to TV watching as a potential irrational act.

2.6.1. Self-Control in the Psychological Literature

In psychological literature, problems of self-control have long been recognized (see e.g. Ainslie 1975). Today, theories of self-control are closely connected with theories of self-regulation or self-regulation failure. While some authors even use the two terms interchangeably, McCullough and Willoughby (2009, p. 71) define self-regulation "as the process by which a system uses information about its present state to change that state". On the other hand, the term "self-control [is reserved] for situations in which people engage in behaviors designed to counteract or override a prepotent response (e.g., a behavioral tendency, an emotion, or a motivation), such as assaulting someone who has angered them, resting after a hard day at work instead of painting the kitchen, or playing hooky instead of going to school". The relationship between the two concepts is therefore as follows: "Not all psychological states that are self-regulated involve self-control […]; however, self-control may rely on mechanisms that are also involved in self-regulation per se" (McCullough and Willoughby 2009, p. 72). Hence, self-control is "the deliberate, conscious, effortful subset of self-regulation" (Baumeister et al. 2007b, p. 351). The psychological understanding of self-control is closely connected to the trade-off between short-term and long-term utility that economists emphasize (see below). McCullough and Willoughby (2009, p. 72) write "when people exert self-control, they modify their response tendencies in a fashion that involves

suppressing one goal so as to pursue another one that is judged to have greater long-term utility". Hence, in the case of television, self-control may be needed to resist the temptation of its immediate reward (entertainment, relaxation) and to pursue instead activities with immediate costs but higher long-term utility.

The detailed theory of self-control emphasizes (among others) two main aspects of self-control: self-control as a personality trait and self-control as a limited resource.

Self-control as a personality trait

One strand of the psychological literature focuses on self-control as a more or less stable personality trait acquired in early childhood (see, e.g., Gottfredson and Hirschi 1990, p. 94-108; McCabe et al. 2004; Baumeister et al. 2007a). Much research has gone into theoretically and empirically identifying the correlations between self-control and other personality traits or characteristics, such as the "Big Five" personality traits[43] (Tangney et al. 2004; Jensen-Campbell et al. 2007), religiosity (McCullough and Willoughby 2009), or political ideology (Tittle et al. 2008) and in analyzing the relationship between self-control and a wealth of outcome variables, such as school outcomes (Mischel et al. 1988), criminal behavior (Gottfredson and Hirschi 1990; Hirschi 2004), or interpersonal success (Tangney et al. 2004). This strand of research also suggests implicitly or explicitly that individual self-control is correlated among different behavioral areas (see Schmeichel and Zell 2007, p. 744).

Self-control as a limited resource

The limited resource or limited strength model of self-regulation was most prominently introduced into the literature by Baumeister and co-authors (Baumeister et al. 1994; Baumeister and Heatherton 1996; Muraven et al. 1998; Baumeister et al. 2007b). Their main argument is that self-control depends on a kind of limited resource, and that effortful exertion of self-control and of other tasks involving self-regulatory effort depletes this resource causing a decrease in performance during subsequent tasks – similar to a muscle becoming tired after exercise. The state of diminished resource after exerting self-control is referred to as ego-depletion. The limited resource model has been confirmed in many experiments and under various conditions and has even found biological support. Gailliot et al. (2007) show that self-control tasks use up glucose and that ego-depletion is reduced when study

[43] The five traits are extraversion, agreeableness, conscientiousness, neuroticism, and openness (see, e.g., McCrae and Costa 1999).

participants consume a glucose drink. A further interesting observation is that active choice, i.e., selection among alternatives, leads to ego-depletion and subsequent impairment of self-control as well (Vohs et al. 2008).

The muscle analogy goes even further. Various studies suggest that repeated exercise can increase self-regulatory strength (for a review see Baumeister et al. 2006). In this respect, it is interesting to note that, in a study by Oaten and Cheng (2006), repeated physical exercise increases subsequent self-control in and out of the lab. One of the several ways this is shown is that participants report studying more and watching less television.

Hence, this body of literature emphasizes the context-dependency of self-control problems. It is, for example, much harder to resist the temptation of TV's immediate gratification after a hard day at work or school, when trying to quit smoking or lose weight, or when engaged in an emotionally strenuous relationship. Additionally, the vast choices of cable and satellite TV might not only increase difficultly in controlling one's TV watching due to the constant availability of suitable programming, but they might also deplete self-regulatory strength on the basis of forcing viewers to choose among the increased options available.

While the two views on self-control discussed here – self-control as a personality trait and self-control as limited resource – emphasize different aspects, they do not run contrary to one another. Although acts of self-control use up a limited resource, this strength resource can be seen as a relevant aspect of personality (for a related discussion see Baumeister et al. 2006).

2.6.2. Economic Literature on Self-Control

Already Adam Smith considered self-control or "self-command" to be an essential human characteristic and wrote in his *Theory of Moral Sentiments*:

> "The qualities most useful to ourselves are, first of all, superior reason and understanding, by which we are capable of discerning the remote consequences of all our actions, and of foreseeing the advantage or detriment which is likely to result from them: and secondly, self-command, by which we are enabled to abstain from present pleasure or to endure present pain, in order to obtain a greater pleasure or to avoid a greater pain in some future time. In the union of those two qualities consists the virtue of prudence, of all the virtues that which is most useful to the individual." (Smith 1759, IV.I.17)

He also recognised that temptation can interfere with one's goals and that self-control is needed to nevertheless act according to one's long-term interests:

> "The man who acts according to the rules of perfect prudence, of strict justice, and of proper benevolence, may be said to be perfectly virtuous. But the most perfect knowledge of those rules will not alone enable him to act in this manner: his own passions are very apt to mislead him; sometimes to drive him and sometimes to seduce him to violate all the rules which he himself, in all his sober and cool hours, approves of. The most perfect knowledge, if it is not supported by the most perfect self-command, will not always enable him to do his duty." (Smith 1759, VI.III.1)

Contemporary economists have taken up the ideas and insight of psychologists presented above in different ways.[44] Most applied work builds on models representing self-control problems in the form of time-inconsistent preferences, i.e., models of quasi-hyperbolic discounting.[45] While standard theory explains intertemporal choice with discounted utility models (Samuelson 1937), where a constant discount rate δ is applied between any two periods,[46] experimental evidence runs contrary to discounted utility models by suggesting that people care more for the present than they do for any future period (for reviews of experiments on intertemporal choice see Loewenstein and Prelec 1992; Frederick et al. 2002). Building on models proposed by Phelps and Pollak (1968) and Elster (1979), quasi-hyperbolic discounting models propose a low discount factor (i.e., a discount factor decreased by β, $\beta \in (0,1)$) between the present moment and some time in the near future and a constant discount factor δ thereafter (e.g. Laibson 1997; O'Donoghue and Rabin 1999b). These models capture the two main aspects of self-control problems, myopia and procrastination. People with myopic vision focus on consuming in the present moment and lack discernment or a long-term perspective in their thinking and planning. Such people undermine their well-being over time. In this respect, goods offering immediate benefits at negligible immediate marginal costs are generally tempting. Procrastination, on the other hand, emphasizes the delaying of activities with immediate costs more than one would have liked to, especially when having evaluated them beforehand and despite the activity's future benefits. In the case of TV consumption, myopia is the more relevant aspect, although one could argue that some people

[44] For a historical account of intertemporal choice in economic thinking see Frederick et al. (2002).

[45] Other approaches include two self-models with a planer and a doer (e.g. Thaler and Shefrin 1981; Fudenberg and Levine 2006) or axiomatic models that analyze preferences over choice sets (e.g. Gul and Pesendorfer 2001; 2005; Dekel et al. 2009).

[46] It can be argued that discounting per see, even in a time-consistent manner, is already irrational as it does not maximize utility over the whole period (see Frederick 2003, p. 89-90).

procrastinate because TV tempts them into not realizing their planned amount of, for example, studying or working.

The main βδ-model has been extended in several directions. For example, consumers can be completely, partly or not at all aware of their future self-control problems (O'Donoghue and Rabin 1999b; 2003), the combination of self-control problems and addictive goods is studied (O'Donoghue and Rabin 1999a; 2002), or the role of choice (O'Donoghue and Rabin 2001), self-commitment (Ariely and Wertenbroch 2002) or incentives (O'Donoghue and Rabin 2005) is explored.

Empirical evidence of self-control problems in non-experimental field settings has mainly been presented for financial decisions. Savings and borrowing decisions (e.g. Angeletos 2001; Skiba and Tobacman 2008; Laibson et al. 2009), the participation in retirement plans (or the role of defaults for these kind of decision) (e.g. Choi et al. 2004), or the amount of credit card dept (e.g. Shui and Ausubel 2004; Meier and Sprenger 2008) are major themes. Labor market decisions have also received some attention (see Fang and Silverman 2004 on labor supply; or DellaVigna and Paserman 2005 on job search). Specific consumption decisions have been studied to a lesser degree. Exceptions are, for example, DellaVigna and Malmendier (2006) on health club visits or Cutler (2003), Shapiro (2005) and Stutzer (2007) on food consumption and obesity. An excellent account of the recent empirical and theoretical literature on time inconsistent preferences is provided by Frederick et al. (2002) and DellaVigna (2009).[47]

However, one important question remains regarding the application of economic models of self-control problems to TV consumption. The economic models implicitly or explicitly assume the same individual β across all behavioral domains. This means that an individual will possess a certain amount of self-control problems in different areas or with regard to different consumption decisions with similar cost benefit structures. For example, individuals that watch TV excessively also tend to smoke or overeat. Some psychological evidence discussed above, however, suggests that withstanding one temptation (e.g. smoking) will lead to poorer regulation of another desire for immediate gratification (e.g. watching TV) (see also Stutzer and Frey 2007, p. 8-9).[48] This issue becomes important when trying to empirically

[47] Recently, theories of self-control have also found neurological and neuroeconomic support (see, e.g., McClure et al. 2004; Knoch and Fehr 2007).

[48] See also Mc Ilwraith (1998) who reports that self-labeled TV addicts eat more junk food but drink less alcohol than the comparison group. There is no relationship between smoking and self-reported TV addiction.

identify people with low or high self-control with regard to their TV consumption. The first view would make it possible to use a generic measurement of self-control, such as the one proposed by Ameriks et al. (2007), while the second view would ask for a measurement specific to TV watching.

2.6.3. Utility Misprediction

Another important aspect for television consumption choice is the prediction – or misprediction – of the future costs and benefits of one's actions. Standard theory assumes that people are able and willing to correctly forecast their future utility. There might be random forecasting errors, but no systematic ones. Experimental and empirical evidence however shows that there are systematic mistakes with regard to the prediction of future utility. For example, people systematically underestimate their adaptation to higher material standards and therefore overestimate their future utility from goods and activities with extrinsic, as compared to intrinsic, attributes or they do not foresee that their tastes change over time (for an overview of causes and consequences of misprediction see Loewenstein et al. 2003; Stutzer and Frey 2007; Frey and Stutzer 2008). With respect to TV consumption, two aspects are especially relevant. First, there is some evidence that people trade off TV consumption with social contacts and relationships (Bruni and Stanca 2008). If people underestimate the extent of utility they derive from such relational goods (i.e., goods with intrinsic attributes), they might watch more TV than optimal and damage their own well-being in the long run. Second, substantial research documents that the beliefs and preferences of heavy TV viewers change due to constant exposure to beautiful and wealthy TV personalities. For example, TV viewing is associated with higher materialism (e.g. Burroughs et al. 2002; Kasser 2002) and lower financial satisfaction (Layard 2005, p. 88-90; Bruni and Stanca 2006). Disregarding these consequences and costs leads to more consumption than optimal.

In sum, the tendency of individuals to watch more TV than they plan or than they consider optimal ex-ante and ex-post due to self-control problems might be aggravated when people mispredict future costs because they underestimate the benefit of social relations or neglect changes in preferences and tastes. Chapter 3.4 of the dissertation explores the extent to which these explanations can account for a negative relationship between TV consumption and subjective well-being.

2.6.4. Existing Evidence

This section presents existing evidence that sheds light on whether TV consumption is rational or irrational in an economics sense.

Economists are either silent on this topic or just assume that TV might be a prominent example for time-inconsistent behavior. For example, O'Donoghue and Rabin use TV as an illustration to explain the main ideas in one of their theoretical papers on self-control: "[P]eople have self-control problems in the form of a *present bias*: our short-term inclinations of what to do – watching TV rather than studying – often don't accord with our own assessment of what is in our long-term best interests – studying rather than watching TV. The point is not that watching TV is necessarily a worse way to spend one's time than studying game theory. Rather, the point is that there is a meaningful sense in which people may wish they would study rather than watch TV, and yet they watch TV" (O'Donoghue and Rabin 2005, p. 2). However, the authors do not provide any empirical evidence that (some) people really watch more TV than is in their long-term interest.

Some psychologists have gone into this issue by analyzing if and why TV can be habit-forming or even addictive. According to their research, the more one sits in front of the TV screen, the lower is one's concentration, one becomes more passive and, because the mental challenge decreases, the activity is increasingly evaluated to be less enjoyable and less worthwhile. Stress is reduced during TV viewing, but not afterwards. Many people therefore continue to sit in front of the TV set, even when the activity is no longer considered to be pleasurable (Kubey and Csikszentmihalyi 1990; 2002). Over the long run, fantasy is diminished, raising dependence on external stimuli (Kubey 1996). As is the case with other addictions (e.g. drugs, see Becker and Murphy 1988), this reduces the marginal utility of a given input, in the case of TV of a given hour of viewing.

However, empirical research about television's addictive features is scarce. McIlwraith and coauthors study self-labeled TV addicts and find that they are more neurotic, introverted, and easily bored than the comparison group and use television more often as distraction from unpleasant thoughts and bad moods (McIlwraith et al. 1991; McIlwraith 1998). Yet, whether watching TV can really be addictive in a medical or psychological sense is open to discussion. Finn (1992) does not find an analogy between drug dependence and TV dependence. Smith (1986) also finds no evidence for such a dependence. While a very small number of participants think they are addicted to TV, they do not exhibit the classical symptoms of being

dependent on noxious substances, such as drugs. In contrast, using the criteria of the diagnostic and statistical manual of mental disorders of the American Psychiatric Association (DSM-IV), which are used in the diagnosis of substance dependence, Kubey (1996) concludes that, according to these criteria, many individuals can theoretically be considered to be dependent on TV consumption. However, Kubey does not test his assumption empirically. Horvath (2004) constructs a special measurement scale for television addiction based on exactly those criteria and concludes that, according to this scale, the amount of television viewing is positively associated with television dependence.

Even if TV watching were to be considered an addiction, according to standard economic theory, the consumption choice does not necessarily have to be irrational or suboptimal. In the model of rational addiction (Becker and Murphy 1988), addicts maximize their current and future utility under stable preferences. Yet, the more recent work on time-inconsistent preferences cited above questions exactly this rationality assumption in the case of addictive goods.

Additionally, there is some (anecdotal) evidence that individuals may have self-control problems regarding TV consumption. 40% of US adults and 70% of US teenagers admit that they watch too much TV (Kubey and Csikszentmihalyi 2002). Some individuals totally abstain from watching TV because they know that they would not otherwise be able to control their television viewing behavior. They cancel their subscription for cable TV in order not to "zap" too much, lock their TV set away in a cupboard or place an uncomfortable chair in front of it. Such self-control mechanisms are not necessary for time consistent individuals. To lower the utility, or raise the cost, of an undesired alternative would be irrelevant and unnecessary.

In sum, television consumption features many characteristics – in economic terms high immediate marginal rewards at low immediate marginal costs but high future costs – that may render it tempting. Hence, self-control is needed to resist this temptation; and if people have problems controlling themselves they may watch more TV than they consider beneficial for themselves. Ultimately, whether individuals act in their own best interest and are rational in an economic sense or not is an empirical question. In the next part of this thesis, this issue is explored by analyzing the relationship between TV consumption and subjective well-being.

3. Television Consumption and Subjective Well-Being

3.1. Introduction

As was shown in the previous part of this thesis, TV watching is a very time-consuming activity, carried out by most people in the majority of countries. Analyzing the effects of television consumption on subjective well-being is therefore not only interesting, but also of considerable relevance. The case for important effects of TV on well-being can be made on two levels. First, at the individual level, it can be suspected that people watch more TV than is in their long-term interest because they are subject to self-control problems and mispredict the future consequences of their consumption choice, as has been argued in chapter 2.6. Second, at the level of society it can be argued that TV consumption has negative external effects independent of individual television watching choice being rational or not. Such externalities ultimately lead to lower average well-being.

Much research has already gone into this second field. There is, for example, a large literature in the social sciences on the negative effects of TV viewing on society, in particular its effect on promoting violence (see e.g. Gunter 1994; Martin and Smith 1997; Johnson et al. 2002; Sparks and Sparks 2002). Another aspect, namely the negative effect of the expansion of television over time on social capital, is studied by Putnam (1995; 2000). He argues that, while TV (and more generally electronic entertainment technology) enables individual tastes to be satisfied more fully, it occurs at the cost of positive social externalities associated with types of entertainment where people get together with other people, as happens with bowling. However, it is difficult to establish a causal relationship. Yet, support for Putnam's thesis comes from a recent paper by Olken (2008). He studies the – plausibly exogenous – differences in TV signal reception in Indonesian villages due to topographical reasons and finds that better signal reception is associated with more TV consumption and substantially lower levels of participation in local social and political activities. There are also a few studies attempting to isolate causality by analyzing the natural experiment of the introduction of TV. A certain Canadian city was unable to receive any TV signals up until 1973 due to its location in a steep valley. Otherwise, it was similar to two cities in the vicinity used as control cases. A study by Williams (1986) suggests that the introduction of TV crowded out other activities, in

particular those outside the home, such as sports' activities and visiting clubs.[49] Another study by Hennigan et al. (1982), based on a natural experiment, takes a look at the advent of TV in the United States which, due to technical reasons, took place at different times in different places. Petty crime, but not violent crime, increased. Looking at the same time period in the US, Gentzkow (2006) finds that the advent of TV reduced voter turnout.[50]

However interesting this second channel from television consumption on well-being may be, this part of the thesis concentrates on the first channel: Do people directly hurt their *own* well-being because they watch too much TV according to their own evaluation? Or do people just watch as much TV as they do because it provides them with considerable utility as would be advocated by standard economic theory? As has been put forward in chapter 2.6, the case for mistakes in TV consumption choice can be formulated within a systematic framework: Individuals may be subject to a self-control problem, mainly induced by the fact that watching TV offers immediate benefits (e.g. entertainment and relaxation) at very low immediate marginal costs. Many costs (e.g. not enough sleep, underinvestment in social contacts, education or career) are only experienced in the future. Individuals with time-inconsistent preferences are therefore unable to adhere to the amount of TV viewing they planned or which, in retrospect, they would consider optimal for themselves. This tendency is aggravated when people mispredict future costs because they underestimate utility from socializing and neglect changes in preferences due to TV consumption. Extensive TV viewing is therefore,

[49] Other interesting results of this study are that TV reduced the reading abilities and creative thinking of children and fostered more aggressive behavior and stereotyped ideas about gender roles. TV also reduced the problem solving capacities of adults. These results might be relevant for effects of TV on well-being on individual as well as on social level.

[50] Further, however theoretical, support for externalities of TV comes from Corneo (2005). He analyzes the possible external effects associated with the individual allocation of work and leisure time. The positive correlation between time spent working and time spent watching TV in 11 OECD-countries is explained by the existence of multiple equilibria. Individual utility maximization produces two different but stable equilibria. In one set of countries, there are more intensive social contacts, and people work less and watch less TV. In another set of countries, people work more. As a consequence, social contacts are difficult to coordinate, and people therefore watch more TV, which requires no such coordination. Due to these external effects, individually rational behavior may lead to higher TV consumption than would be Pareto efficient. Equilibria can be inversely Pareto ranked by their amount of television viewing.

according to this view, the result of mispredicting utility and a self-control problem, leading to a lower level of individual utility than what could be achieved.

It is very difficult to discriminate between a theory of optimal TV watching and a theory of over-consumption based on observed behavior. How is it possible to assess from the outside whether, for example, three or four hours TV viewing a day are too much and are actually regretted by the consumer? There is also no conclusive information about optimal consumption behavior in TV viewers' reaction to price changes. Whether or not people consistently allocate their time and income, they will react to relative price changes in the consumption of TV watching in the direction predicted by standard economics. A person's observed behavior indicates that he/she is subject to self-control problems only if that person adheres to external commitment devices that limit the future choice sets. Yet, there exists only anecdotal and no systematic evidence for the use of such self-commitment devices (e.g. people put an uncomfortable chair in front of their TV or cancel their cable subscription in order not to watch too much TV or even get rid of their TV set).

We pursue a completely different approach and propose data on subjective well-being to study whether people make systematic mistakes in their choice of time devoted to TV watching. Reported subjective well-being or life satisfaction can serve as a proxy for experienced utility as suggested by happiness research. Based on this methodology, it is in principle possible to study whether higher TV consumption lowers an individual's utility or well-being as suggested by the pessimistic view about people's TV watching. In our analysis, we explore to what extent standard information on individual TV consumption and subjective well-being can inform the debate.

The empirical analysis studies data from the first two waves of the European Social Survey. This is an exceptionally rich data set that provides information for almost 90,000 people from 27 different countries for 2002 to 2006. The baseline econometric estimate lends support to the hypothesis of over-consumption: excessive TV viewers, on average, report lower life satisfaction. This negative correlation holds even after controlling for a large number of covariates of individual well-being.

A negative correlation between TV consumption and subjective well-being could, however, well be the result of reverse causation. It is quite plausible that unhappy people watch more TV than happy people. It is in fact interesting in its own right to understand whether people resort to TV watching when they are unhappy. If TV viewing serves as a substitute act (e.g.

for human relationships or more active forms of leisure for the lonely and bored) and involves negative long-term consequences for well-being, the negative correlation might even be the result of a self-enforcing vicious circle. These causality issues can neither be resolved with an extensive set of control variables in a multiple regression analysis nor with panel data.[51] Instead one would want to study large scale changes in people's opportunities to watch TV that are set from outside. We are not aware that suitable data, such as a natural experiment, exist. Instead three other aspects of the interrelation between TV consumption and subjective well-being are studied: (i) whether TV viewing affects people's preferences and beliefs, (ii) whether the utility costs of extensive TV consumption depend on the opportunity cost of time and (iii) whether a more attractive offering in the form of more TV channels leads to a higher utility loss because self-control problems are aggravated.

With regard to the first aspect, we study in a path analysis whether people who watch more TV report to a greater extent preferences and beliefs that are negatively correlated with subjectively perceived well-being. The results indicate that watching TV is positively related to people's material aspirations, as well as to anxiety levels, and negatively related to their financial satisfaction and trust in others, as well as the perceived relative frequency of social activities.

Second, it is explored whether mainly people with significant opportunity costs of time regret the amount of time they spend watching TV. The problem is hypothesized to primarily affect people with flexible working hours, who can freely transmit time between leisure and work. In contrast, people with low opportunity costs of time, such as retired or unemployed people, or individuals with fixed working hours, are little burdened by their lack of willpower, and therefore experience no significant utility loss, even if they spend many hours in front of a TV. In fact, we find that particularly individuals with severe time constraints, who watch TV for many hours, report lower life satisfaction. For people with low opportunity cost of time, we measure no negative effect on reported satisfaction with life from watching TV.

While more choice potentially raises individual welfare (if people are able to rationally maximize utility, as is assumed in the traditional economic framework), with regard to the last aspect, it is hypothesized that people with severe self-control problems suffer a utility loss when having more TV channels to choose from. The positive effect from a potentially better

[51] The estimation of an individual fixed effects model based on panel data filters out the precise time-invariant self-control problem we would be interested in.

match between TV programs and individual preferences is more than offset by the loss of well-being resulting from over-consumption. We indeed find a statistically significant negative interaction term between (residual) TV viewing and the number of TV channels, and calculate a negative marginal effect for additional TV channels on the well-being of heavy viewers. This is consistent with the hypothesis of limited self-control.

Hence, this part of the thesis shows that for a major human activity in modern life – television consumption – individual behavior cannot be fully understood if consumer sovereignty is simply taken for granted. The results of the empirical analysis suggest that TV viewing is an activity over which individuals have systematically incomplete foresight and control. The utility gained is lower than what it could be.

Chapter 3.2 reviews the existing literature on TV and subjective well-being, including the few studies undertaken in economics, and develops the basic testing strategy. The following chapter 3.3 presents the basic econometric estimates. The next three chapters deal with the possibility of reverse causation and address the role of changes in preferences and beliefs, of opportunity costs of time, and of number of TV channels. Chapter 3.7 concludes.

3.2. Literature and Testing Strategy

3.2.1. Literature on Television Consumption and Subjective Well-being

There already exist some studies looking at the utility provided by TV consumption, which can be assessed in several ways.[52] The first approach captures the short run or instant affects by measuring activity enjoyment ratings. In the context of time use studies, individuals are asked to rate TV viewing compared to other leisure time activities. In the United States, in 1985, with a rating of 7.8 on a scale from 0 to 10, TV consumption proved to be valued somewhat higher than the average enjoyment of 7 derived from other activities. Nevertheless, it ranks lower than most other activities undertaken in leisure time (Robinson and Godbey 1999: 243). On the index of positive affect of 900 Texan women constructed by Kahneman and co-workers (2004b) using the day reconstruction method (DRM), TV ranks with 4.2 (on a scale from 0 to 6) roughly in the middle of all activities. With 2.2 hours per week, it is one of the most time consuming activities of these women. With the experience sampling method, participants are randomly asked how they feel at a particular moment in time, using a beeper or a hand-held computer. On an affect scale, composed of cheerfulness, friendliness, happiness, and sociability, TV viewing is located in the lower part of the scale and can hardly be distinguished from reading, working, hobbies and idling. Eating, social contacts, sports and sex, on the other hand, are clearly higher ranked. Nevertheless, individuals have little inclination to do anything else (Kubey and Csikszentmihalyi 1990). These short-run evaluations capture the momentary affect, but the total utility derived by individuals, including opportunity costs, is difficult to evaluate with these measures.

Some studies analyze more general satisfaction with TV, independent of a particular moment of watching it. In a survey undertaken in 1975 in the United States, TV consumption was given an average rating of 5.9 points on an enjoyment scale ranging from 0 to 10. It ranks considerably behind most other leisure time activities and below the average of 6.8 of all rated activities. In 1995, TV viewing with 4.8 points ranked even lower when compared to all other leisure time pursuits. Surprisingly enough, women even rated it below cleaning and men below cooking (Robinson and Godbey 1999, p. 243, p. 250). But such surveys are faced with the problem that watching TV is associated with a low ("couch potato") image. For that

[52] For a review of general concepts and measurements of utility and subjective well-being, see, e.g., Frey and Luechinger (2007).

reason, the answers given may reflect what is taken to be socially desirable. It should be noted that surveys on *general* life satisfaction (as used in our study) are not affected by this bias. Nevertheless, it is interesting to note that short-term and long-term evaluations of TV watching tend to diverge, or as Robinson and Godbey (1999, p. 299) put it: "We may not enjoy television in general, but the programs we saw last night were pretty good."

Several studies relate TV viewing to general subjective well-being. In a study of roughly 3,000 Americans in 1979 (Morgan 1984), people watching a lot of TV considered their life to be more "lousy" on an index consisting of the aspects lonely, boring, depressing, unsatisfying, uneventful and unhappy, and less "great" on an index consisting of the aspects interesting, active, meaningful, fun, fulfilling, stimulating and exciting, compared with people watching less TV. This relationship remains statistically significant when controlling for socio-demographic characteristics. There is, however, no such relationship between TV consumption and a "calm" life, composed of the dimensions happy, comfortable, pleasant, good, secure and peaceful. Using a small sub-sample from the General Social Survey in 1975, a discriminant analysis reveals that non-viewers (that is, according to the definition of the authors, people watching less than half an hour a day) are less satisfied with family life and are in general more happy than viewers (Tankard and Harris 1980). In a random survey of 1,000 West Germans, there is also a negative correlation between the duration of TV viewing and general life satisfaction, controlling for size of household, education and age. The authors (Espe and Seiwert 1987) postulate a causal influence of dissatisfaction with life on TV consumption, but offer no corresponding evidence. In another study for Germany, based on the German Socio-Economic Panel, a curvilinear relationship between the number of hours spent watching TV and life satisfaction is found (Jegen and Frey 2004). Moderate TV consumption is related to higher life satisfaction than no consumption or extensive consumption. Based on panel information, short-term individual variation in TV consumption is not correlated with overall life satisfaction in an economically relevant manner.

Economic research on happiness (see the surveys in Frey and Stutzer 2002a; b) emphasizes that evaluations are relative. Subjective well-being depends on one's relative income compared to the reference group and on the difference between actual and aspired income (Frank 1999; Easterlin 2001; Stutzer 2004). TV brings other people's lives into one's own home, so that one's reference group may extend far beyond the immediate neighborhood. Moreover, what is shown on TV as "reality" is far from representative; rich people and luxury tend to be overrepresented (Lichter et al. 1994). Based on this idea, Layard (2005) studies the

relationship between TV consumption, perceived relative income and happiness by using data from the US General Social Survey. His multiple regression estimates suggest that TV viewing has a negative effect on subjective well-being, partly due to a direct effect and partly due to an indirect effect through subjectively perceived relative income. Similar results are found by Bruni and Stanca (2006) who argue that TV viewing raises income aspirations leading to lower life satisfaction. A recent cross-sectional study (Shrum et al. 2003) is also in line with these results. Using a sample of 321 Americans, a statistically significant negative relationship between TV consumption and life satisfaction is found. This is mainly due to the positive correlation between TV consumption and materialism, which is in turn negatively related to life satisfaction (see also Kasser 2002). However, the authors only use age and a scale for "socially desired responding" as controls and causality is unclear. A similar negative correlation is found in an earlier study (Sirgy et al. 1998), comparing the situation in the United States and Canada, Australia, Turkey and China. The extent of TV viewing is positively linked with materialism and negatively linked with life satisfaction in the USA, but much less so in the other countries. Another study analyzing a moderating variable between TV consumption and life satisfaction finds that watching TV crowds out relational activities and therefore decreases life satisfaction (Bruni and Stanca 2008).

While a handful of studies exist that analyze the relationship between TV consumption and subjective well-being, the causality issue has not received much attention (with the exception of the few economic studies that highlight some specific aspect of the relationship between TV and well-being). The general notion of irrationality or self-control problems in connection with TV consumption has not been systematically studied in connection with subjective well-being. In the following, we therefore attempt to provide a broad empirical account of the relationship between television consumption and life satisfaction based on a systematic economic framework that is presented below.

3.2.2. Basic Hypothesis and Testing Strategy

Self-control and time inconsistency

Standard economics assumes that people have no self-control problems, and that they are able to make decisions based on their long-term preferences. Hence, consuming goods and pursuing activities that some people consider an addiction, or at least a bad habit, such as smoking cigarettes, watching a high amount of TV, or constantly eating fast food, are

considered a rational act. Contrary to this view, many people judge their own and other people's consumption behavior as irrational, in the sense that they think they would be better off if they consumed less of some goods. Goods offering immediate benefits at negligible immediate marginal costs are generally tempting. As has been shown in chapter 2.6.1, the psychological literature offers a large body of evidence of low self-control (for an overview see e.g. Baumeister and Heatherton 1996). In economics, such inconsistent time preferences are most prominently formulated in models of (quasi-)hyperbolic discounting (see, e.g., Laibson 1997). A low discount factor (i.e., a discount factor decreased by β, $\beta \in (0,1)$) is applied between the present moment and some time in the near future and a constant discount factor δ thereafter (for a review, see Frederick et al. 2002 and section 2.6.2). Self-control problems might be aggravated when people do not correctly predict the future consequences of their decisions (see section 2.6.3).

Decision utility versus experienced utility

Based on revealed preference, it is however difficult to discriminate between the view of TV consumers as rational actors and the view of consumers facing self-control problems or mispredicting future utility.[53] Therefore, two extensions of the traditional emphasis on ex ante evaluation and observed decision are pursued. In the first extension, the standard economic concept of decision utility is complemented by the concept of experienced utility (Kahneman et al. 1997). The latter refers to an individual's evaluation of actual experiences in terms of positive and negative affects or in terms of satisfaction. This distinction between decision and experienced utility makes it possible that the ordering of experiences systematically diverges from the ordering of options derived from observed behavior. The second extension is closely related to the first, and emphasizes ex post evaluations as a valuable source of information about the possibility of bounded rationality in people's decision-making. How do people fare after they have made decisions? If temptation interferes with people's decision making or if people do not completely foresee the consequences of their actions, there might well be a gap between what individuals do and what they like.

[53] We are aware that there are specific situations in which the standard economic model rules out certain types of behavior and mere observation of a certain action rejects the standard economic model. There are some studies successfully pursuing this approach. Two important examples that document the kind of behavior where the standard model does not apply are DellaVigna and Malmendier (2006), who examine gym attendance under different contracts, and Skiba and Tobacman (2008), who show that certain types of payday loans would always be rejected by time-consistent individuals.

This poses the question of how the (normative) standard is ascertained, and whether seemingly irrational behavior should be judged welfare reducing because it violates certain time consistency criteria. While there is an extended debate on this issue (see, e.g., Bernheim and Rangel 2005; Read 2006) we use people's own evaluation as a standard. This standard is operationalized in terms of individuals' judgments of their overall subjective well-being, rather than how they evaluate options when faced with a particular decision.

Basic hypothesis: watching too much TV

Hence, it is hypothesized that TV consumption is such a case where people are subject to self-control problems and where decision utility and experience utility might diverge. Immediate marginal costs of watching TV are extremely low and many costs only arise in the future which makes it tempting for people to watch more TV than they planned to or consider optimal ex post. For people facing similar restrictions, heavy TV viewing therefore indicates impeded self-control and misprediction of future costs rather than a taste for TV. Accordingly, heavy TV consumption is expected to result in lower experienced utility. This hypothesis has, of course, to be understood *ceteris paribus*. Individual utility depends on a large number of other factors, which have to be taken into account in order to identify the specific effect of TV on utility. In the empirical analysis, experienced utility is proxied by life satisfaction, and the effects are partial, controlling for major socio-demographic factors normally included in a happiness equation (see, e.g., Frey and Stutzer 2002a; b).

Testing strategy

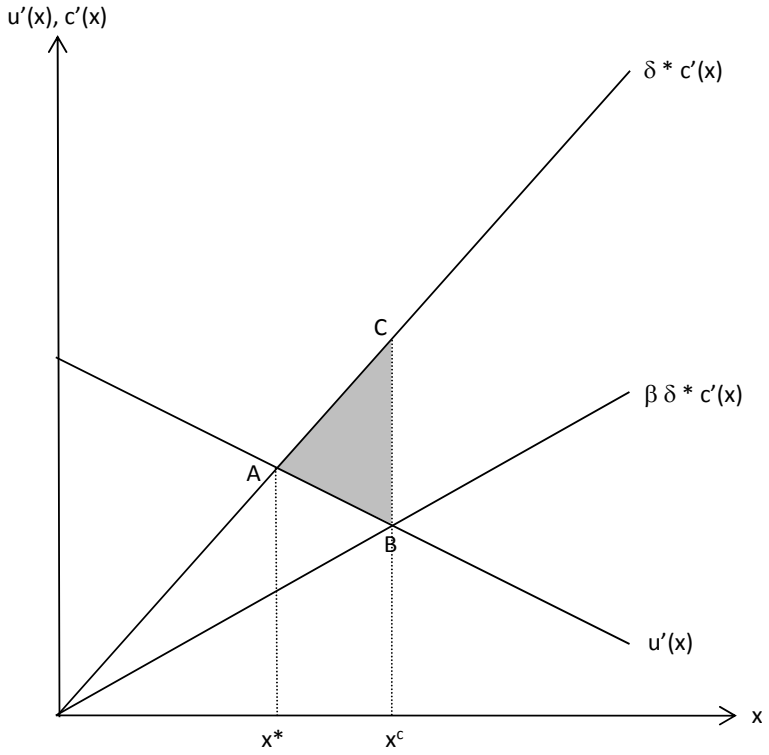
The conceptual framework of decision utility and experienced utility is summarized in a graphical analysis of a simple two-period model and extended to illustrate the empirical testing strategy. We highlight the case where people have time-inconsistent preferences. The analysis would however lead to similar implications for the case of utility misprediction, i.e., for a general underestimation of future costs.

Hence, an individual decides on the consumption of x, here the amount of time devoted to TV viewing, based on the enjoyment of x, i.e., utility u(x) in period 1, and the future costs c(x) in period 2, discounted by a factor δ. This reflects that benefits are experienced instantaneously, with zero immediate costs. The costs resulting from TV consumption are largely experienced in the future (see chapter 2.6). In this choice situation, with TV viewing offering instant benefits at negligible immediate marginal costs, time inconsistency may arise. At the outset, a

consumer (i.e., in period 0) plans to spend x* minutes watching TV, equalizing marginal benefits and marginal future costs, i.e., u'(x)=δ*c'(x) representing the first order condition. However, when faced with the actual decision about TV consumption and the temptation of immediate gratification, future costs are only partly taken into account by individuals with time-inconsistent preferences (here by a factor $\beta \in (0,1)$) and the consumption plan is revised so as to equalize u'(x)=β*δ*c'(x). People who lack the self-control to maintain their original plans end up consuming x^c, i.e., more than they consider optimal for themselves in the long-run, and experience an individual welfare loss, while people without self-control problems stick to the planned consumption level x*.

Figure 6 illustrates this situation for a specific set of preferences. It shows x*, the planned consumption, and x^c, the actual consumption level chosen by an individual with a self-control problem, i.e., by an individual with $0 \leq \beta < 1$. The triangle ABC indicates the individual welfare loss due to over-consumption. Total experienced utility over the two periods is lower than what it could be if x* were consumed.

Figure 6: The Loss of Experienced Utility with Time Inconsistent Preferences



Based on people's reported judgment of their overall satisfaction with life, it is now, in principle, possible to directly capture the welfare loss. For otherwise similar people, the

subjective well-being of heavy TV viewers can be compared with the subjective well-being of moderate viewers, and the difference can be attributed to systematic errors in consumption due to a lack of willpower. This basic relationship is estimated in chapter 3.3.

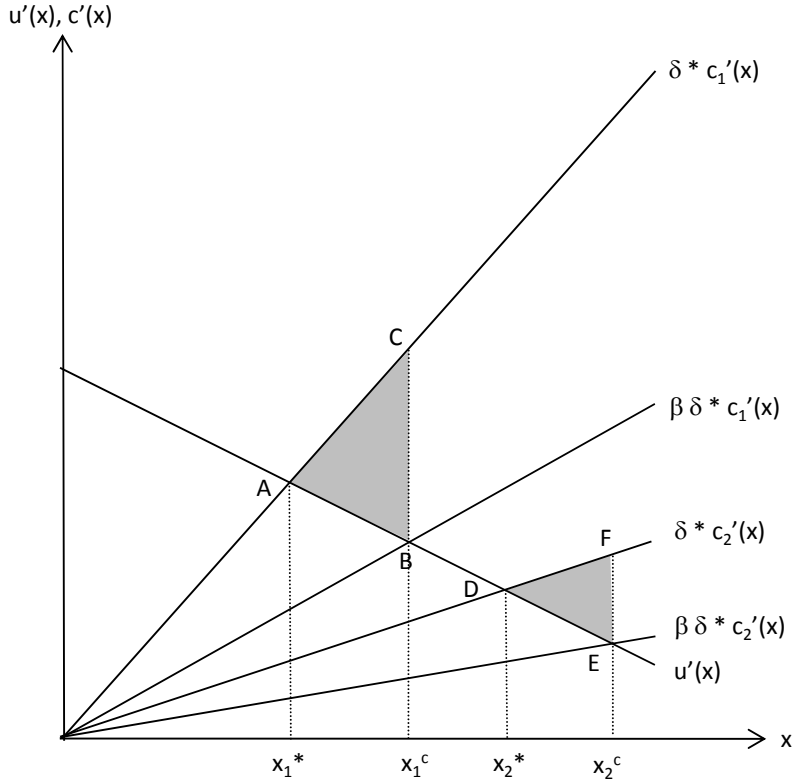
However, with this approach it is difficult to establish a causal relationship between TV consumption and subjective well-being. An omitted variable bias could occur because unobserved individual differences, like being an introvert, might well be related to lower subjective well-being and higher TV consumption, regardless of any self-control problem. Reverse causation is possible: unhappy people might spend more time watching TV. Finally, preference heterogeneity with regard to TV viewing might be directly related to people's reports of their subjective well-being.

We argue that these empirical challenges can be overcome in a refined approach studying differences in the restrictions television consumers face. We outline two cases: a) where lower opportunity costs of time lead to a lower welfare loss due to overconsumption for consumers with time inconsistent preferences; and b) where an extended opportunity set, here the number of available TV channels, decreases the experienced utility of consumers with a severe self-control problem.[54]

Figure 7 offers a graphical analysis that illustrates the first case. Two different levels of marginal costs of television consumption are shown: $c_1'(x)$ and $c_2'(x)$. An individual with time-inconsistent preferences and high opportunity costs of time $c_1'(x)$ would like to consume, both ex ante and ex post, the amount of TV x_1^* but ends up consuming x_1^c due to the self-control problem, i.e., $0 \leq \beta < 1$. As in Figure 6, her welfare loss due to the overconsumption is represented by area ABC. For a time-inconsistent individual with low time opportunity costs $c_2'(x)$, both the optimal level x_2^* and the actually chosen level x_1^c of TV consumption are much higher. However, the loss in experienced utility due to the overconsumption (area DEF) is much lower than with high opportunity costs of time (in the case of the specific costs and preferences shown in Figure 7).

[54] This analysis is related to the one by O'Donoghue and Rabin (2001), who show in a theoretical model that more choice among tasks with immediate costs and future benefits can lead to more severe procrastination, and that a person might procrastinate more when pursuing important goals rather than unimportant ones. Our analysis is much simpler and emphasizes the case in which a more attractive alternative with immediate benefits and future costs might lead to more severe myopic behavior.

Figure 7: The Loss of Experienced Utility with Time Inconsistent Preferences for Individuals with different Opportunity Costs of Time

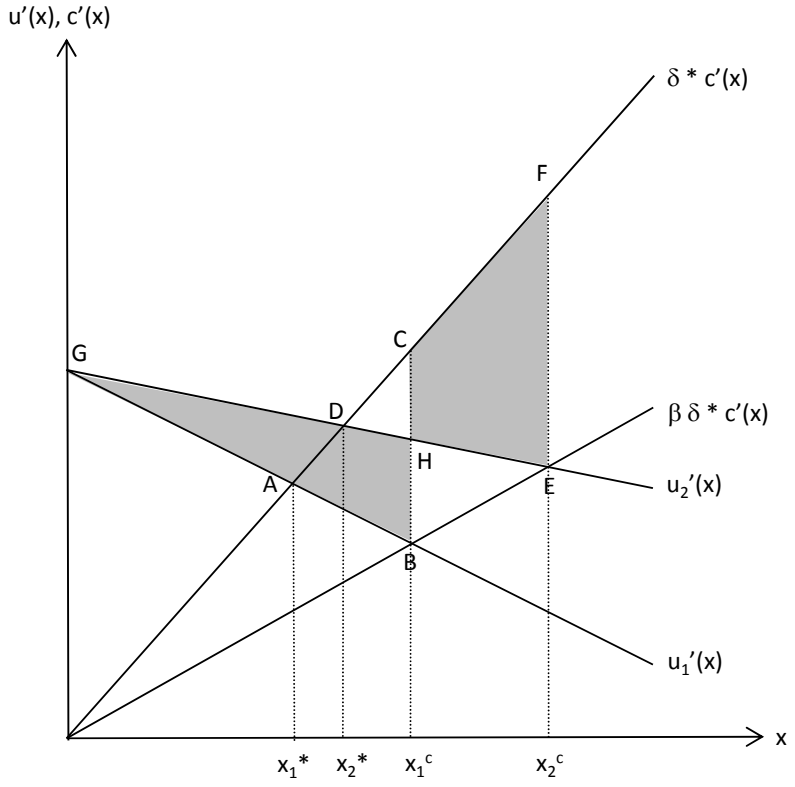


In chapter 3.5, we compare the relationship between TV viewing and life satisfaction for people with different time opportunity costs controlling for other major determinants of subjective well-being. A large negative effect of TV consumption on life satisfaction for individuals with high opportunity costs of time compared to a small or no negative effect for individuals with low opportunity costs of time can then be attributed to self-control problems. In such a case, reverse causation is much less plausible than in the case of just looking at the basic relationship between TV consumption and subjective well-being. There is no obvious explanation for why unhappy people with high opportunity costs would revert to TV watching while unhappy people with low opportunity costs would not.

Figure 8 illustrates the second idea to identify self-control problems with television viewing. An expansion of the choice set, i.e., a higher number of TV channels, is represented by an increase in the marginal utility of TV consumption from $u_1'(x)$ to $u_2'(x)$. An individual with time-consistent preferences increases TV consumption from x_1^* to x_2^* and experienced utility is increased by the area ADG. For an individual with time-inconsistent preferences, there are two effects on experienced utility resulting from the shift in marginal utility. First,

experienced utility from the initial amount of TV viewing is increased, as more TV channels are assumed to mean more variety and better preference satisfaction. In other words, consumer surplus is increased, reflected by the area BHG.[55] Second, the increased attractiveness of TV viewing leads to a revision of consumption plans. At this stage, an expansion of the opportunity set might reduce overall experienced utility. As people with a self-control problem undervalue future costs when faced with the decision of turning their TV on or off, they increase consumption more than would be optimal. Again, they realize a level of experienced utility that is below what they could experience if they could optimally choose TV consumption. The reduction in experienced utility due to a further increase in consumption amounts to the area CHEF. Whether more opportunities make people with a self-control problem worse off overall depends on the relative size of the two effects on people's experienced utility. In Figure 8, for the particular combination of marginal utility, marginal costs and β, CHEF is larger than BHG.

Figure 8: Gains and Losses in Experienced Utility due to a More Attractive Technology



[55] Area BHG consists of two parts: ADG is the increase in actual consumer surplus and ABHD is part of the former welfare loss that is now offset.

In chapter 3.6, we use the possibility of a negative net effect as a testing strategy to identify self-control problems in TV consumption. It is hypothesized that the experienced utility of people with a severe self-control problem in TV viewing is reduced when they have access to a larger number of TV channels. We are aware that this is a conservative test and that the threshold is set high to reject the rationality hypothesis. Even if nobody loses from an increased opportunity set, there might still be over-consumption. However, the over-consumption cannot be detected, either by revealed behavior or by studying reported subjective well-being.

3.3. Basic Empirical Analysis

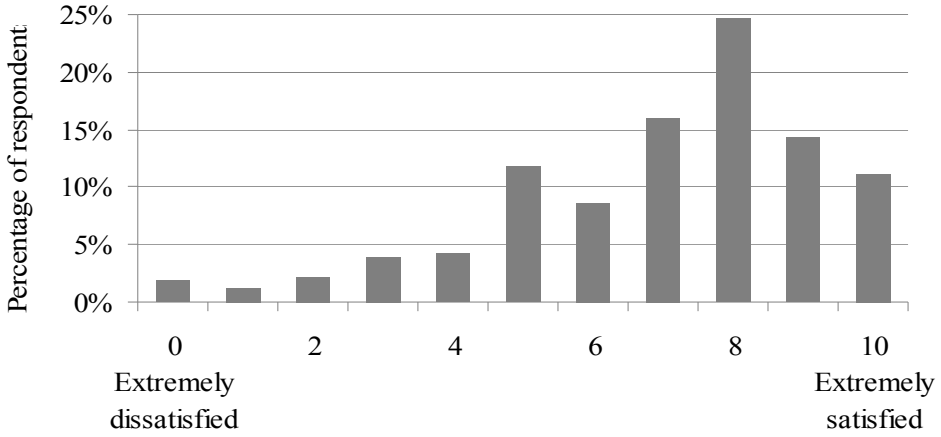
3.3.1. Data and Empirical Specification

In order to empirically address the basic hypothesis of TV over-consumption, we use the same data as in chapter 2 (the first two waves of the European Social Survey (ESS)[56]). The ESS was carried out in 27 European countries in 2002/2003 and 2004-2006. In each country, a range of 600 to 3,000 people were interviewed in each wave. For 688 observations, data for life satisfaction or TV viewing are missing, resulting in a sample of 89,208 observations.

In addition to life satisfaction and television viewing time, the ESS includes a large number of socio-demographic characteristics. Control variables to be used are logarithmic household income (adjusted for comparative price[57]), household size (square root), gender, age, age squared, marital status, children, employment status, education, working hours, working hours squared, citizenship and area of living. For descriptive statistics see Table A3 in the Appendix.

The dependent variable *life satisfaction* is the response to the question: "All things considered, how satisfied are you with your life as a whole nowadays?" Answers are given on an 11-point scale ranging from 0 ("extremely dissatisfied") to 10 ("extremely satisfied") (Figure 9). The average life satisfaction amounts to 6.9 (standard deviation 2.3).

Figure 9: Reported Life Satisfaction in 27 European Countries 2002-2006



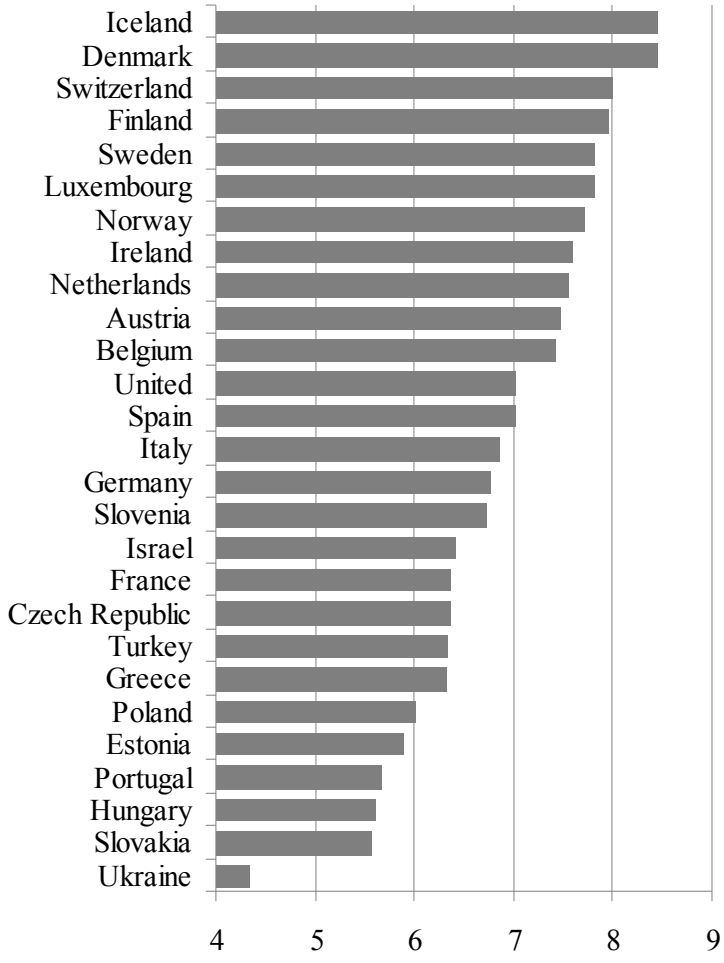
Data source: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005).

[56] For a description of the data see Jowell et al. (2003; 2005).

[57] Data on comparative price levels are from the World Bank's World Development Indicators (World Bank several years).

This average varies considerably between countries, and ranges from 4.3 in the Ukraine up to 8.5 in Iceland (Figure 10). It is sometimes doubted that such life satisfaction data are comparable between nations, as the answers might partly reflect cultural differences. To control for such unobserved differences, we include country/wave-fixed effects in the regression analysis.

Figure 10: Average Reported Life Satisfaction in 27 European Countries 2002-2006



Note: Average reported life satisfaction on a scale from 0 ("extremely dissatisfied") to 10 ("extremely satisfied").
Data source: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005).

Television consumption is also captured by one single question: "On an average weekday, how much time do you spend watching television?" Answers are given in 8 categories, ranging from "no time at all" to "more than three hours". For descriptive statistics see chapter 2.4 as well as Table A3 in the Appendix, and for a critical evaluation of the data see chapter 2.3.

Based on the data described, a microeconomic happiness function is specified. The *life satisfaction*$_i$ of individual *i* depends on his or her television consumption TV_i and on personal characteristics X_i, as well as on country specific effects D_j in country *j*[58] and year fixed effects Y_t:

$$Life\ satisfaction_i = \beta_0 + \beta_1\, TV_i + \gamma_1\, X_i + \gamma_2\, D_j + \gamma_3\, Y_t + \varepsilon_i$$

As the extent of television consumption is captured in a categorical variable with an open-ended category for those spending a lot of time watching TV, TV consumption cannot be included as a continuous variable. Instead, we include dummy variables in the regression equation. Those who watch less than half an hour of television a day form the reference group. In order to simplify the analysis, the 6 original categories for people who watch more than half an hour of TV a day are combined into 3 categories with the highest category including people who watch more than 2.5 hours TV a day.

3.3.2. Estimation Results

Table 9 reports the partial correlation between TV consumption and reported life satisfaction. The first specification applies an ordinary least squares estimator. In view of the categorical nature of the dependent variable, a second specification is added, estimating an ordered probit. The similarities in the relative size and statistical significance of the coefficients indicate that the least squares estimator delivers – with some exceptions – a satisfactory overall approximation. As the least squares results are easier to interpret, we discuss primarily these results and mention the differences to the ordered probit estimation where applicable.

People who watch less than half an hour of TV a day are more satisfied with their life, ceteris paribus, than people who choose any other level of TV consumption. For those watching TV for anything between half an hour and 2.5 hours, average reported life satisfaction is about 0.05 points lower than in the reference group of people watching for less than half an hour. The estimated effect is even larger for people watching for more than 2.5 hours a day. On average, they report a 0.14 points lower life satisfaction than people in the reference group. The coefficient for the highest TV viewing category is statistically significantly different from

[58] Countries covered in both waves of the ESS are treated as separate entities; i.e. country/wave dummies are included into the regression. The empirical results are however robust to the inclusion of country dummies.

zero at the 99% level. The coefficients for 0.5 to 2.5 hours are not statistically significant at conventional levels in the OLS regression. They are however significant at the 99% level in the ordered probit regression. The general finding is thus consistent with the basic hypothesis that extensive TV watching makes people worse off because it indicates over-consumption due to a self-control problem and misprediction of future costs.

Table 9: Television Consumption and Life Satisfaction

Dependent variable:	OLS		Orderd probit	
Life satisfaction	Coefficient	t-value	Coefficient	z-value
TV consumption				
No TV at all	-0.065	-1.33	-0.002	-0.07
Less than 0.5 hour TV	Reference group			
0.5 to 1.5 hours TV	-0.049	-1.54	-0.044 **	-2.77
More than 1.5 to 2.5 hours TV	-0.040	-1.26	-0.049 **	-3.04
More than 2.5 hours TV	-0.137 **	-4.21	-0.081 **	-4.95
Individual/household characteristics				
ln (household income, PPP)	0.347 **	30.49	0.156 **	27.35
Working hours	0.002	1.39	0.001	1.47
Working hours, squared	-0.00005 **	-3.31	-0.00002 **	-2.85
Age	-0.071 **	-25.53	-0.035 **	-24.94
Age, squared	0.0007 **	25.34	0.0003 **	24.93
Male	Reference group			
Female	0.106 **	7.03	0.065 **	8.60
Foreigner	Reference group			
Citizen of country	0.298 **	8.23	0.147 **	8.09
No children at home	Reference group			
Children living at home	-0.156 **	-7.37	-0.087 **	-8.24
Marital status				
Married, with partner	Reference group			
Married, without partner	-0.766 **	-6.68	-0.361 **	-6.28
Separated, with partner	-0.472 **	-3.80	-0.238 *	-3.85
Separated, without partner	-0.906 **	-14.37	-0.438 **	-13.94
Divorced, with partner	-0.291 **	-5.22	-0.142 **	-5.09
Divorced, without partner	-0.650 **	-19.62	-0.314 **	-18.95
Widowed, with partner	-0.334 **	-3.00	-0.131 *	-2.33
Widowed, without partner	-0.558 **	-18.52	-0.276 **	-18.27
Single, with partner	-0.277 **	-8.38	-0.145 **	-8.73
Single, without partner	-0.539 **	-20.82	-0.283 **	-21.85

Table to be continued

Continuation of Table 9

Education				
Not completed primary education	-0.382 **	-9.81	-0.178 **	-9.18
Primary or first stage of basic education	Reference group			
Lower secondary or second stage of basic education	0.062 *	2.47	0.027 *	2.14
Upper secondary education	0.170 **	6.85	0.062 **	4.99
Post secondary, non-tertiary education	0.306 **	8.37	0.125 **	6.85
First stage of tertiary education	0.319 **	10.88	0.120 **	8.17
Second stage of tertiary education	0.369 **	9.09	0.132 **	6.51
Employment status				
Paid work, employed	Reference group			
Paid work, self-employed	0.044	1.55	0.026 (*)	1.83
Unemployed, looking for a job	-1.193 **	-29.95	-0.511 **	-25.68
Unemployed, not looking for a job	-0.811 **	-14.58	-0.343 **	-12.36
In education	0.299 **	8.82	0.149 **	8.79
Permanently sick or disabled	-1.102 **	-22.17	-0.477 **	-19.25
Retired	-0.050 (*)	-1.83	-0.008	-0.55
Community or military service	0.149	1.04	0.089	1.23
Housework, looking after children	-0.014	-0.55	0.023 (*)	1.71
Area of living				
Big city	Reference group			
Suburbs	-0.037	-1.44	-0.013	-1.02
Town, small city	0.033	1.61	0.023 *	2.24
Country village	0.145 **	6.88	0.078 **	7.39
Farm, home in countryside	0.205 **	5.99	0.114 **	6.64
Country/wave-fixed effects	Yes		Yes	
Year-fixed effects	Yes		Yes	
Constant	6.566 **	38.30		
Observations	89,208		89,208	
R-squared / Pseudo R-squared	0.21		0.05	

Notes: Variable for household size (square root) and dummy variable for the highest income category are not shown. Dummy variables indicating missing observations for income, household size, working hours, age, sex, citizenship, children, marital status, education, employment status and area of living are not shown as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005), World Development Indicators (World Bank several years).

The partial correlation between TV consumption and life satisfaction is estimated for the whole population and is thus representative of an average effect of TV viewing across people. It is most likely that some groups of people suffer higher disutility from extensive TV consumption than others. In chapter 3.5, we formulate ex ante hypotheses (in contrast to ex

post rationalization) about people who are expected to lose the most if they watch TV extensively.

The partial correlation cannot easily be explained as spurious, simply reflecting some specific individual characteristics of people who spend a lot of time in front of the TV. A large set of socio-demographic characteristics that relate systematically to reported life satisfaction and, possibly, to TV consumption as well is taken into consideration. These characteristics include, e.g., respondents' age, sex, nationality, marital status, household income, level of education, and employment status. Several literature surveys discuss the correlation of these variables with reported life satisfaction (see, e.g. Frey and Stutzer 2002b). Specifically for the ESS, the determinants of life satisfaction are investigated in Lelkes (2006).

Partial correlations of other factors with life satisfaction allow for the assessment of the size of the effect of TV consumption in relative terms. For example, the difference in life satisfaction between those watching more than 2.5 hours and those watching less than half an hour (0.14) is about one-third of the difference in life satisfaction between people who have never been married and are without a partner and married people (0.54). The difference is almost as high as the one between people having upper secondary education and those who simply completed primary school or the first stage of basic education (0.17). Finally, the difference is about one-eighth of the life satisfaction differential between unemployed people looking for a job and people in paid work (1.19).

3.3.3. Causality Issues

So far, the negative partial correlation between TV consumption and subjective well-being has been interpreted in terms of over-consumption leading to a lower utility level. However, the partial correlation could well be the result of reverse causation. It is quite plausible that unhappy people watch more TV than happy ones. The problem can be attenuated by controlling for as many situational factors as possible in the regression equation. However, it cannot be resolved, neither with an extensive set of control variables in a multiple regression analysis nor with panel data.[59] Ideally, one would need information about exogenous changes in the opportunities for TV consumption, e.g. due to satellite TV being shut down or due to

[59] Panel data allow for the control of unobserved time-invariant individual specific factors that affect reported subjective well-being, as well as the explanatory variable of interest. This is not helpful in our analysis, because the entire theory is based on some people suffering from an unobserved time-invariant self-control problem.

TV being introduced in a new place as a result of technical innovation. We are not aware of any such event that could be connected to survey data on reported subjective well-being.

We propose a different approach for further analysis of the effect of TV consumption on subjective well-being and for shedding light on the issue of causality. First, we provide evidence that relates extensive TV consumption to systematically different preferences and beliefs. This would support the view that there are long-term costs of TV consumption that are very difficult to foresee. Second, we formulate and test additional hypotheses exploiting the heterogeneity in the expected effect of TV over-consumption for groups of people with different opportunity costs of time. Third, we test whether people with a severe self-control problem suffer more if they have more choice and a more attractive TV offer, i.e., if they have more TV channels available.

3.4. TV Viewing and Differences in Preferences and Beliefs

This section presents a first extension of the basic analysis on the statistical relationship between TV viewing and life satisfaction. A path analysis is conducted to get an idea of the different ways that TV consumption can affect life satisfaction.

3.4.1. Utility Misprediction and TV Consumption

When people make decisions about watching TV, they are expected (and assumed to be able) to assess and to adequately take into consideration for themselves the long-term costs of TV viewing. As has been discussed in chapter 2.6.3, recent research on the prediction of future utility challenges these assumption underlying the revealed behavior approach (for a survey see Wilson and Gilbert 2003). People systematically underestimate that their preferences change due to processes of adaptation (Loewenstein et al. 2003). Moreover, misprediction of utility is asymmetric, whereby the positive effects of a high material standard of living are overestimated and the positive effects of activities with strong intrinsic attributes, like socializing, are underestimated (Frey and Stutzer 2008). These aspects of mispredicting utility are directly relevant for TV consumption choice. People are expected to watch too much TV if they underestimate the future costs of TV viewing due to neglecting social contacts and rising material aspirations. We are aware that it is not possible to discriminate between limited self-control with perfect and with imperfect projection of future beliefs in the current empirical framework. However, we are convinced that it is important to take misprediction of utility into account when refining the analysis of TV consumption.

Previous research has looked at the differences in beliefs and preferences between heavy and light TV viewers, induced by the fact that life portrayed on TV differs systematically from real life. Television programs contain much more violence and chaotic relationships and show many more affluent people and more luxury than exist in real life (e.g. Lichter et al. 1994). People who spend a lot of time watching TV therefore tend to overestimate crime rates, show more anxiety (Gerbner et al. 2002) as well as less trust in others (e.g. Gerbner et al. 1980; Signorielli et al. 1995). They overestimate the affluence of others (O'Guinn and Shrum 1997), report higher material aspirations (e.g. Richins 1987; Sirgy et al. 1998; Shrum et al. 2005; Bruni and Stanca 2006) and rate their own relative income lower, which is related to lower subjective well-being (Layard 2005).

3.4.2. Empirical Analysis

Data and Specification

We perform a path analysis to shed some light on the long-term consequences of TV consumption and how they correlate with subjective well-being. An analysis is made as to whether people who watch more TV report lower financial satisfaction (keeping household income constant) and tend to believe that it is important to be rich, whether they feel less safe or trust others less and whether they think that they participate less in social activities.

We thereby use the same data set, the European Social Survey, as in chapter 3.3. Financial satisfaction is captured with the question "[…] how do you feel about your household's income nowadays?" Answers are given on a scale from 1 ("living comfortably on present income") to 4 ("very difficult on present income"), which we revert for the empirical analysis. Respondents indicate on a scale from 1 to 6 how important it is for them to be rich. They are asked how safe they feel walking in the local area after dark. Answers range from 1 ("very safe") to 4 ("very unsafe"), and, again, we revert this scale in order to let higher values reflect a better feeling of safety. The answers to the question, "Generally speaking, would you say that most people can be trusted or you can't be too careful in dealing with people?" serve as a proxy for trust. Answers range on an 11-point scale from 0 ("you can't be too careful") to 10 ("most people can be trusted"). Finally, respondents are asked: "Compared to other people of your age, how often would you say that you take part in social activities?" Answers range from 1 ("much less than most") to 5 ("much more than most").

Based on this data, we estimate a path model with intervening variables. First, the effect of TV viewing on preferences and beliefs M_i is estimated separately for each of the analyzed preferences and beliefs. We again control for personal characteristics X_i, as well as for country/wave specific effects D_j and year fixed effects Y_t.

$$M_i = \alpha_0 + \alpha_1 TV_i + \alpha_2 X_i + \alpha_3 D_j + \alpha_4 Y_t + \varepsilon_i$$

Then, these intervening variables are included into the original life satisfaction regression presented in chapter 3.3, both separately and all five variables together.

$$Life\ satisfaction_i = \beta_0 + \beta_1' TV_i + \delta M_i + \gamma_1 X_i + \gamma_2 D_j + \gamma_3 Y_t + \varepsilon_i$$

If TV watching makes people unhappy because it changes, at least to some extent, their preferences and beliefs, then we should find a) that there is a statistically significant relationship between TV watching and the respective preference or belief (M_i), b) that there is a statistical relationship between the preference or belief and life satisfaction and c) that the direct relationship between watching TV and life satisfaction gets smaller when the variable measuring the preference or belief is included into the life satisfaction regression. This means that β_1' in the above specification should be statistically significantly smaller than β_1 in the baseline regression.[60]

Results

Table 10 presents the ordinary least square estimates[61] of the partial correlations between TV viewing and the different measures capturing people's beliefs and preferences. The coefficients of the control variables are not explicitly shown. In all five estimations, the coefficients for watching more than 2.5 hours TV show the expected signs and are statistically significant at the 99% level: heavy TV viewers report lower satisfaction with their financial situation, place more importance on affluence, feel less safe, trust other people less and think that they are involved in less social activities than their peers. The effects are sizeable and (in relation to the respective scale of the dependent variable) are the largest for "importance of being rich" and "feeling of safety". For intermediate levels of TV consumption, there are also positive effects on the importance of being rich and negative effects on the feeling of safety (statistically significant at the 95% to 99% level). There is no statistically significant correlation between intermediate levels of TV consumption and financial satisfaction and trust. The effects of intermediate levels of TV consumption on perceived relative frequency of social activities are even positive, however only statistically significant at the 90% level.

[60] The analysis corresponds to the mediator model used often in social psychology, see e.g. Baron und Kenny (1986), MacKinnon et al. (2002).

[61] In view of the categorical nature of the dependent variables, ordered probit estimates would be more accurate. However, the results of such estimates differ very little from the OLS estimates. As the latter are easier to interpret, they are presented here.

Table 10: Effects of Television Consumption on Preferences and Beliefs

Dependent variable:	Financial satisfaction		Importance to be rich		Feeling of safety		Trust in people		Social activities	
	Coefficient (t-value)		Coefficient (t-value)		Coefficient (t-value)		Coefficient (t-value)		Coefficient (t-value)	
No TV at all	-0.023 (-1.39)		-0.117 (3.80)	**	0.018 (1.01)		-0.037 (-0.68)		-0.108 (-4.93)	**
Less than 0.5 hour TV	Reference group									
0.5 to 1.5 hours TV	0.013 (1.21)		0.044 (2.20)	*	-0.041 (-3.54)	**	-0.008 (-0.23)		0.024 (1.68)	(*)
More than 1.5 to 2.5 hours TV	0.008 (0.77)		0.116 (5.73)	**	-0.059 (-5.12)	**	-0.018 (-0.50)		0.026 (1.77)	(*)
More than 2.5 hours TV	-0.030 (-2.69)	**	0.148 (7.23)	**	-0.085 (-7.25)	**	-0.145 (-4.01)	**	-0.051 (-3.45)	**
Individual controls	Yes		Yes		Yes		Yes		Yes	
Country/wave-fixed effects	Yes		Yes		Yes		Yes		Yes	
Year-fixed effects	Yes		Yes		Yes		Yes		Yes	
Observations	84,687		81,652		88,264		88,879		87,461	
R-squared	0.38		0.13		0.19		0.17		0.08	

Notes: (1) Ordinary least squares estimations, t-values in brackets.

(2) Dependent variables: Financial satisfaction on scale from 0 to 3, importance to be rich on scale from 0 to 5, feeling of safety on scale from 0 to 3, trust in people on scale from 0 to 10, perceived relative frequency of social activities on scale from 0 to 4.

(3) Individual controls include variables for working hours, working hours squared, household income (log), age, age squared, gender, citizenship, marital status, children, education, employment status, area of living and household size (square root), and a dummy variable for the highest income category. Dummy variables indicating missing observations for income, household size, working hours, age, sex, citizenship, children, marital status, education, employment status, and area of living are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005),World Development Indicators (World Bank several years).

In the next step, an analysis is made of whether those preferences and beliefs influenced by TV affect reported life satisfaction. Accordingly, we include the five variables in the life satisfaction-television equation. For simplicity, we present least squares estimates and include the intervening variables cardinally.[62]

[62] The respective estimates with the intervening variables included ordinally do not differ qualitatively from those presented here.

Table 11: TV Consumption and Life Satisfaction: Preferences and Beliefs

Dependent variable: Life satisfaction	excl. channels	incl. all channels	incl. financial satisfaction	incl. importance to be rich	incl. feeling of safety	incl. trust in people	incl. social activities
No TV at all	-0.065	-0.025	-0.049	-0.068	-0.068	-0.058	-0.030
	(-1.33)	(-0.54)	(-1.04)	(-1.39)	(-1.40)	(-1.21)	(-0.62)
Less than 0.5 hour TV	Reference group						
0.5 to 1.5 hours TV	-0.049	-0.056 (*)	-0.062 (*)	-0.049	-0.037	-0.048	-0.056 (*)
	(-1.54)	(-1.87)	(-1.99)	(-1.53)	(-1.18)	(-1.53)	(-1.80)
More than 1.5 to 2.5 hours TV	-0.040	-0.038	-0.049	-0.038	-0.023	-0.038	-0.049
	(-1.26)	(-1.24)	(-1.57)	(-1.18)	(-0.71)	(-1.20)	(-1.54)
More than 2.5 hours TV	-0.137 **	-0.070 *	-0.119 **	-0.133 **	-0.111 **	-0.114 **	-0.121 **
	(-4.21)	(-2.27)	(-3.76)	(-4.10)	(-3.44)	(-3.57)	(-3.77)
Intervening variables:							
Financial satisfaction		0.662 **	0.743 **				
		(67.52)	(74.72)				
Importance to be rich		-0.036 **		-0.035 **			
		(-6.61)		(-5.99)			
Feeling of safety		0.192 **			0.309 **		
		(21.34)			(33.21)		
Trust in people		0.125 **				0.160 **	
		(42.89)				(53.60)	
Social Activities		0.248 **					0.323 **
		(34.22)					(43.01)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country/wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations				89,208			
R^2	0.21	0.29	0.26	0.21	0.22	0.24	0.23
t-test Sobel: more than 2.5 hours TV			-2.69 **	-4.73 **	-7.09 **	-4.00 **	-3.44 **

*Notes: (*1) Ordinary least squares estimations, t-values in brackets.

(2) Intervening variables: financial satisfaction on scale from 0 to 3, importance to be rich on scale from 0 to 5, feeling of safety on scale from 0 to 3, trust in people on scale from 0 to 10, perceived relative frequency of social activities on scale from 0 to 4.

(3) Individual controls include variables for working hours, working hours squared, household income (log), age, age squared, gender, citizenship, marital status, children, education, employment status, area of living and household size (square root), and a dummy variable for the highest income category. Dummy variables indicating missing observations for financial satisfaction, importance to be rich, feeling of safety, trust in people, social activities, income, household size, working hours, age, sex, citizenship, children, marital status, education, employment status, and area of living are included as well.

(4) Sobel's t-test for the difference in coefficients with and without intervening variable has been calculated for regressions without observations with missing values for the respective intervening variable, i.e., for regressions with the same number of observations as in Table 10.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005),World Development Indicators (World Bank several years).

The first column in Table 11 presents the results without including any intervening variable (corresponding to the results in Table 9). In the second column, all five intervening variables are included in the regression. All partial correlations with life satisfaction have the expected signs and are statistically significant at the 99% level. The coefficient for people watching more than 2.5 hours TV is halved and drops from –0.14 in the regression without any intervening variable in column 1 to –0.07. Including the intervening variables one by one into the regression equations (columns 3 to 7 in Table 11) shows that the indirect effect of TV consumption on life satisfaction is smallest for 'importance to be rich' and is of about the same size for the other four variables (looking at the differences in coefficients for more than 2.5 hours TV viewing). According to the Sobel's test,[63] differences in coefficients between regression with and without intervening variables are all statistically significant for the category of heavy TV consumption.

The results of the path analysis show that the negative relationship between TV consumption and life satisfaction can partially be explained by differences in beliefs and preferences of people watching more TV. This finding corroborates the hypothesis that there are long-term consequences – or negative internalities – of TV consumption. If these consequences are not completely foreseen, people overestimate the utility from TV consumption and end up at a lower utility level. We are aware that the path analysis does not exclude reverse causation. However, it supports a richer picture of psychological processes involved in people's demand for TV consumption that might help in understanding any systematic errors in TV consumption choice.

[63] The Sobel's test shows the statistical significance of the indirect path from an explanatory variable (TV consumption) over the intervening variable to the dependent variable (life satisfaction). For OLS, the multiplied coefficients of this path correspond to the difference in coefficients of the explanatory variable in the regressions with and without intervening variable (MacKinnon et al. 1995; MacKinnon et al. 2002).

3.5. Opportunity Costs of Time and the Effect of Watching TV on Life Satisfaction

So far, it has been assumed that self-control problems in TV consumption affect everybody alike. Additional tests of the hypothesis that self-control problems in TV consumption reduce people's utility are possible if different types of individuals can be identified who suffer to a different extent from over-consumption. We emphasize that in particular individuals with *high opportunity costs of time* can use time more profitably when not watching TV. This includes, for instance, the self-employed (e.g. craftsmen, lawyers, architects or artists) or persons in high positions (e.g. managers, top bureaucrats or politicians), who can freely transfer time from leisure to work. For this group of individuals, the self-control problem of watching too much TV generates considerable costs. Their utility is lower due to their inability to fully control themselves. In contrast, individuals with *low opportunity costs of time* suffer little, if any, disutility when they fail to watch the amount of TV they would consider optimal for themselves. Accordingly, it is hypothesized that TV consumption significantly lowers the life satisfaction of individuals with high opportunity costs of time, while it has a smaller negative effect on the life satisfaction of individuals with low opportunity costs of time (see Figure 7 in chapter 3.2).

Data

Opportunity costs of time cannot be measured directly in our data. Therefore, we use different indicators to distinguish between individuals with high and low opportunity costs of time.

(i) People who can freely transfer time between work and leisure tend to have higher (monetary) opportunity costs of time compared to people with fixed working hours. Hence, respondents are assigned to the two groups according to the flexibility of their working hours. Answers to the question "[P]lease say how much the management at your work allows you to be flexible in your working hours?" are given on an 11-point scale ranging from 0 ("I have no influence") to 10 ("I have complete control"). Respondents who indicate a value between 0 and 5 constitute the group with low opportunity costs of time, while those who give an answer between 6 and 10 form the other group. Only individuals who are employed (at least part time) are included in these sub-samples. As this question is only available for the first wave of the ESS the number of observations is reduced to 6,793 for the group with high opportunity costs of time and 7,042 for the group with low opportunity costs of time.

(ii) As a second indicator, we use employment status and profession. Retirees and the unemployed tend to have a large amount of free time and therefore form the group with low

opportunity costs of time. On the other hand, working people, especially those who are self-employed and those in high positions and professions (legislators, senior officials, managers and professionals according to ISCO-88 classification) are assigned to the group with high opportunity costs of time. The group with high opportunity costs of time includes 12,696 respondents and the group with low opportunity costs of time 21,013 respondents.

Table A3 in the Appendix reports summary statistics for the different groups, as well as for the whole population. The groups divided according to flexibility of working hours do not differ much in most socio-demographic characteristics. The group with high opportunity costs of time watches a bit less TV (e.g. 20% of respondents watch more than 2.5 hours TV a day compared to 26% in the other group) and has a somewhat higher income, as well as a higher level of education. People in this group report, on average, half a point higher life satisfaction (7.47 compared to 6.95) than people in the other group. The groups divided according to employment status and profession differ more with regard to their socio-demographic characteristics. The group with high opportunity costs of time includes more young people and more males and individuals in this group watch considerably less TV (e.g. only 19% of respondents watch more than 2.5 hours TV a day compared to 49% in the other group) and have a much better education.

Empirical results

Table 12 reports the results of linear regression estimates for the different groups according to the different criteria. In order not to overload the table, the regression coefficients for the control variables are not explicitly shown. They are very similar to those presented in Table 9.

Columns 1 and 2 show the estimation results for sub-samples with high and low opportunity costs of time according to flexibility of working hours. Individuals in the group with high opportunity costs of time, who watch more television than the reference group, report lower life satisfaction ceteris paribus. The effects are quite considerable. The subjective well-being of viewers who watch half an hour and more television a day is between 0.35 and 0.43 points lower than that of light viewers spending less than half an hour watching television a day. The effects are statistically significant at the 99% level. The magnitude of the coefficients corresponds to about two-thirds of the difference in life satisfaction between people who are divorced and without a partner and married people (0.65), and amounts in the highest category to over one-third of the effect of unemployment (-1.19) (both estimates are taken from the full sample). In contrast, for people with low opportunity costs of time, the

coefficients of all television viewing categories are smaller (between -0.09 and -0.15) and not statistically significant.

Table 12: TV Consumption and Life Satisfaction: Opportunity Costs of Time

Dependent variable: Life satisfaction	Flexibility of working hours as distinction criteria		Employment status / profession as distinction criteria	
	Group with high opportunity costs of time	Group with low opportunity costs of time	Group with high opportunity costs of time	Group with low opportunity costs of time
No TV at all	-0.435 ** (-2.89)	0.103 (0.59)	-0.094 (-0.95)	-0.148 (-1.13)
Less than 0.5 hours TV	Reference group			
0.5 to 1.5 hours TV	-0.350 ** (-3.84)	-0.085 (-0.81)	-0.085 (-1.40)	0.019 (0.19)
More than 1.5 to 2.5 hours TV	-0.357 ** (-3.83)	-0.042 (-0.39)	-0.187 ** (-2.94)	0.098 (1.00)
More than 2.5 hours TV	-0.425 ** (-4.28)	-0.147 (-1.35)	-0.315 ** (-4.59)	-0.009 (-0.09)
Individual controls	Yes	Yes	Yes	Yes
Country/wave-fixed effects	Yes	Yes	Yes	Yes
Year-Fixed effects	No	No	Yes	Yes
Constant	6.196 ** (9.94)	4.894 ** (7.83)	7.152 ** (15.42)	7.274 ** (15.65)
Observations	6.739	7,042	12,696	21,013
R-squared	0.14	0.15	0.18	0.25

Notes: (1) Ordinary least squares estimations, t-values in brackets.

(2) Group 1 contains respondents with flexibility of working hours of 6 and higher on a scale from 0 to 10 and group 2 contains respondents with flexibility of working hours of 5 and lower. In both groups, respondents' employment status is "paid work, employed" and nothing else. Group 3 contains the self-employed, as well as managers, senior officials, legislators, professionals (according to ISCO-88 classification) with employment status "paid work" (employed or self-employed) and nothing else, and group 4 contains retirees and the unemployed with no other employment status.

(3) Individual controls include variables for working hours, working hours squared, household income (log), age, age squared, gender, citizenship, marital status, children, education, employment status, area of living and household size (square root), and a dummy variable for the highest income category. Dummy variables indicating missing observations for income, household size, working hours, age, sex, citizenship, children, marital status, education, employment status, and area of living are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005),World Development Indicators (World Bank several years).

A similar picture emerges when comparing the self-employed, managers, senior officials, legislators and professionals with retirees and unemployed persons (columns 3 and 4 in Table 12). Coefficients in the high opportunity costs of time sub-sample are considerable in size. The average life satisfaction of people watching more than 1.5 hours TV a day is between 0.19 and 0.32 points lower compared to people who watch less than half an hour a day. These effects are statistically significant at the 99% level. In contrast, for the group with low opportunity costs of time, no correlation between television consumption and reported life satisfaction is visible. The coefficients are not statistically significant and very small. The coefficient for watching 0.5 to 1.5 hours TV is not statistically significant in either group.

Hence, the results are consistent with the hypothesis that (some) people have a self-control problem when it comes to TV watching, and this self-control problem considerably reduces the subjective well-being of people with high opportunity costs of time but not (to the same extent) of people with low opportunity costs of time. Of course, one could still ask whether the negative correlation for people with high opportunity costs of time is a causal relationship and, if so, in which direction the causality goes. However, it is difficult to understand why dissatisfied people, who have high opportunity costs of time, would resort to TV viewing, while dissatisfied people with low opportunity costs of time would not.

3.6. TV Channels, Self-Control and Subjective Well-Being

This chapter presents a third extension of the basic relationship between TV consumption and subjective well-being. It studies whether the effect of having a larger number of TV channels available, i.e., a larger choice set, raises people's subjective well-being, as standard economic theory would predict, or if it rather increases temptation to watch more TV than optimal and therefore even reduces utility of some individuals.

3.6.1. Hypothesis and Testing Strategy

The expansion and diversification of media supply, due to VCR, cable or satellite has, in many countries, gone hand in hand with increased TV viewing time (see the collected studies in Becker and Schoenbach 1989). Spending more time in front of the TV set is consistent with rational consumers who optimally choose their viewing time, as well as with TV viewers who are subject to a self-control problem (see Figure 8 in chapter 3.2). A study on the introduction of cable TV in Israel, comparing neighborhoods with a difference-in-difference approach, complements the picture by people's evaluation of their consumption choice (Weimann 1996). It is found that, with cable TV, there is a significant increase in the percentage of viewers agreeing to the statements "I often watch more television than I intend to" (28% before the introduction of cable and 41% one year later) and "watching television is often a waste of time" (24% before the introduction of cable and 36% one year later). The expanded choice set due to technological advance seems to have led to an increase in the number of people watching more TV than planned, or more than they think is good for them.[64]

While more choice potentially raises individual welfare (if people are able to rationally maximize utility, as is assumed in the traditional economic framework), it is hypothesized here that people with severe self-control problems suffer a utility loss. The positive effect from a potentially better match between TV programs and individual preferences is more than offset by the loss of well-being resulting from over-consumption (see Figure 8 in chapter 3.2).

The hypothesis is tested, based on recent data from the European Social Survey, World Values Survey and Television Key Facts from IP Network. In the first step, consumers who

[64] Asking people directly whether they think that they watch too much TV could, of course, lead to answers that are motivated by social desirability. It should be noted that surveys on general life satisfaction (as used in our study) are plausibly not affected by such a bias that is systematically correlated with some specific consumption behavior.

might have a self-control problem are identified as those people with a large positive residual in a regression explaining the amount of TV viewing according to individual socio-demographic characteristics (referred to as "heavy viewers"). In the second step, the effect of a larger choice of TV channels on subjective well-being is estimated for heavy TV viewers compared to moderate TV viewers. Based on more than 125,000 individual observations from 76 country samples, we find a statistically significant negative interaction term between (residual) TV viewing and the number of TV channels, and calculate a negative marginal effect for additional TV channels on the well-being of heavy viewers. This is consistent with the hypothesis of limited self-control.

We briefly discuss and empirically address two alternative explanations for the observed statistical findings. First, we take into account that the measure for the number of TV channels might not be representative for heavy TV viewers and that the degree of representativeness might vary systematically across countries. Second, the average negative marginal effect might also reflect some negative net effect from increased market competition that benefits some people while penalizing others, irrespective of heavy TV viewers suffering a self-control problem. In particular, competition between channels is expected to benefit consumers who are valuable to advertisers, i.e., young adult viewers and female viewers. In our robustness analyses, we do not find evidence for the two alternative hypotheses. First, the negative marginal effect for additional TV channels holds for a sample adjusted to the differences in diffusion of terrestrial, cable and satellite TV across countries and over time. Second, heavy TV viewers amongst young adults and women do not experience an increase, but a reduction in the amount of well-being, similar to that found in the full sample.

3.6.2. Empirical Analysis

Data

The empirical analysis is based on the individual level data from the first two waves of the European Social Survey (ESS) already used above and supplemented by data from the third and forth waves of the World Value Survey (WVS) in order to get a larger number of country samples. They are connected with data on the number of TV channels at the country level

collected by IP Network.[65] Data from the ESS is for 21 European countries in 2002/2003[66] and 25 European countries in 2004-2006[67]. With the WVS, data on the number of TV channels is available for 28 countries in the years 1995-1997[68] and 2 countries in the years 2000/2001.[69] Countries common to more than one survey or wave are treated as separate entities, as they are observed in different years. In each country, between about 600 and 3,000 individuals were interviewed per wave, supplying us with a total sample of 127,949 observations.[70]

The three key variables in our analysis are TV consumption, reported satisfaction with life and the number of TV channels available in a country.

In the ESS, *television consumption* is, as above, captured by the question "On an average weekday, how much time do you spend watching television?", with answers falling into 8 categories, ranging from "no time at all" to "more than 3 hours". In the WVS, the question is "How much time do you usually spend watching television on an average weekday?", with answers coded into 4 categories, ranging from "do not watch television or do not have access to TV" to "more than 3 hours". For each category, the mid-point value of the time interval is calculated. For the top category, "more than 3 hours", 3.5 hours is chosen. Average TV viewing time in the sample is 2.0 hours (standard deviation 1.1). There is, however,

[65] For the ESS data, see Jowell et al. (2003; 2005). The data are archived and distributed by the Norwegian Social Science Data Services (NSD). For the WVS data see European Values Study Group and World Values Survey Association (2006) and for the IP Network data see IP Network (several years).

[66] The countries included are Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

[67] The countries included are Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, the Ukraine, and the United Kingdom.

[68] The countries included are Belarus, Brazil, Bulgaria, Croatia, the Czech Republic, Estonia, Finland, Germany, Hungary, India, Japan, Latvia, Lithuania, Macedonia, Mexico, Norway, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, the Ukraine, USA and Venezuela.

[69] The two countries are South Africa and Spain.

[70] Of the 131,189 people originally surveyed in the countries included in the analysis, 2,336 did not answer the question regarding their amount of TV consumption and 993 did not answer the question about their life satisfaction.

substantial variation between countries. TV consumption is lowest in Mexico (with 1.1 hours) in wave 3 of the WVS and highest in Macedonia (with 2.7 hours) in wave 3 of the WVS.

Individual *life satisfaction* is again measured by the question: "All things considered, how satisfied are you with your life as a whole nowadays / these days?" Answers are given on an 11-point scale ranging from 0 ("extremely dissatisfied") to 10 ("extremely satisfied") in the ESS, and on a 10-point scale ranging from 1 ("dissatisfied") to 10 ("satisfied") in the WVS. To make the two scales comparable, the lowest two categories in the ESS, 0 and 1, are combined into one category. Average life satisfaction in the sample amounts to 6.7 (standard deviation 2.4), ranging from a low of 4.0 in the Ukraine in wave 3 of the WVS to a high of 8.5 in Denmark in wave 2 of the ESS.

In addition, both surveys include a large number of socio-demographic characteristics, which can be used as control variables in the life satisfaction regressions. In order to have the variables comparable across the two surveys, they are slightly differently coded than in the previous chapters (see below).

Statistical data on the number of *television channels* is available at the country level, published by IP Network in the form of the number of channels available to 70% of households. We take data that relates to the year the individuals were surveyed or the closest year available. The number of TV channels available to 70% of the population amounts, on average, to 10.3 channels (standard deviation 12.6) and ranges from 1 in India and Romania to 62 in the United States. The median is 4.5 channels (see Table A4 and Table A5 in the Appendix). TV services are offered by terrestrial, cable and satellite providers. In the robustness analysis, we take into account that, due to the differences in the diffusion of these technologies, the measure for the number of channels might not be representative for the groups crucial to our empirical test.

Empirical strategy and results

We proceed in two steps to test for possible self-control problems in TV viewing. In the first step, individual TV viewing time is regressed on respondents' socio-demographic characteristics for each of the 76 country samples separately, and the residual TV viewing time, not explained by these individual characteristics, is calculated. Heavy viewers, i.e., respondents who watch more TV than predicted by their individual characteristics, and who therefore have large residuals, are suspected to be those with a possible self-control problem when it comes to television viewing. Having many tempting TV channels tends to aggravate

heavy viewers' self-control problem, leading to a higher utility loss than having less TV channels. Of course, heavy viewers could just be those with a high preference for TV consumption. In this case, more TV channels would raise their utility level, as it increases the probability that there is a program that matches their preferences. It should at least not reduce their utility level, because they could just ignore the additional channels. (In the robustness analysis below, we will test for differential consequences of competition between TV channels on different groups of heavy TV viewers.) The individual characteristics we use to explain TV viewing time are household income, age, gender, nationality, employment status, education, marital status, type or size of place of living and, additionally for the ESS, household size and working hours.[71] Between 3 and 32% of the variation in TV viewing time is explained by these individual characteristics.[72] Residual TV viewing time ranges from -3.41 to 3.21 hours (see Table A4 in the Appendix). In order to make the residuals comparable across countries, they are converted into deciles for each country.

In the second step, we test how additional TV channels affect the individual welfare of unpredictably heavy TV viewers. If the latter have a self-control problem, they are expected to experience lower individual well-being with additional channels. In our test, reported life satisfaction is used as an approximation to individual welfare.

Two microeconometric life satisfaction functions are specified. In the first one, the life satisfaction LS_i of individual i depends on (the decile of) his or her residual television consumption $ResidTV_i$, (as an indicator of a possible self-control problem regarding TV consumption), on the interaction between this indicator and the number of TV channels N_j[73]

[71] It must be noted that some of these variables could be systematically related to having a self-control problem. It could, for example, be hypothesized that people with low self-control face a higher probability of becoming unemployed. Controlling for employment status might therefore not be appropriate. However, only controlling for the exogenous factors age and gender in the first step does not change the general results of the subsequent empirical analysis.

[72] The regressions are very similar to the one presented in Table 2 of chapter 2.4.

[73] We include the number of TV channels in its logarithmic form into the regression. This reflects that the marginal importance of an additional channel decreases with an increasing number of channels. While this specification results in the best statistical fit, linear or quadratic specifications lead to similar results. The constitutive term of the interaction effect, the number of TV channels, is not included into the regression in order to be able to include country/wave-fixed effects. Nevertheless, there should be no bias as it is controlled for the number of TV channels through the country/wave dummies. See also the second specification, where number of TV channels is included separately.

available in country j, on personal characteristics X_i, as well as on country/wave specific effects D_j and year fixed effects Y_t:

$$LS_i = \beta_0 + \beta_1 ResidTV_i + \beta_2 (ResidTV_i * log(N_j)) + \gamma_1 X_i + \gamma_2 D_j + \gamma_3 Y_t + \varepsilon_i$$

The control variables used are income, age, gender, whether born in the country of residence or not, employment status, education, and marital status. The variables are not coded in exactly the same way in both surveys, but similar enough to make them comparable.

Column (A) in Table 13 shows the regression results for the first specification. The interaction effect between residual TV viewing and the logarithm of the number of channels available has a negative sign, is large (-0.014) and statistically significant at the 99% level. The higher a person's residual TV consumption is, the smaller the marginal effect of an additional channel on his or her life satisfaction. Yet, according to this specification, whether more TV channels in fact have a negative effect on the life satisfaction of heavy TV viewers is not assessable. The marginal effect of the number of TV channels on life satisfaction could merely be smaller for people with high residuals than for people with low residuals, but not negative. However, it can already be said that people who watch much more TV than predicted, based on their individual characteristics, seem to benefit the least from additional TV channels. If unpredictably high TV consumption indeed reflects personal tastes, then this result might already come as a surprise.

Table 13: TV Consumption, Number of TV Channels and Life Satisfaction

Dependent variable:	(A)		(B)	
Life satisfaction	Coefficient	t-value	Coefficient	t-value
Television				
Decile of residual TV viewing (5^{th} decile=0)	-0.014 **	-4.30	-0.013 **	-4.15
log (number of TV channels, mean adjusted)			-0.038	-0.60
Decile of residual TV viewing * log (number of TV channels)	-0.015 **	-3.99	-0.015 **	-3.93
Individual/household characteristics				
Income deciles	0.112 **	13.04	0.105 **	8.69
Age	-0.081 **	-17.38	-0.087 **	-18.34
Age, squared	0.001 **	17.55	0.001 **	18.47

Table to be continued

Continuation of Table 13

Male	Reference group			
Female	0.083 **	4.78	0.028	0.093
Not born in country of residence	Reference group			
Born in country of residence	0.218 **	6.18	0.359 **	7.35
Marital status				
Married	Reference group			
Divorced	-0.620 **	-15.47	-0.628 **	-12.93
Separated	-0.882 **	-14.68	-0.846 **	-11.26
Widowed	-0.580 **	-16.12	-0.626 **	-16.39
Not married, living with partner	-0.313 **	-7.85	-0.248 **	-5.02
Not married, living without partner	-0.528 **	-19.20	-0.485 **	-15.00
Education				
No formal or incomplete primary education	-0.458 **	-5.05	-0.336 **	-2.83
Complete basic or primary education	Reference group			
Upper or post secondary, non-tertiary education	0.161 **	5.77	0.075	1.27
Tertiary education	0.294 **	7.64	0.289 **	4.84
Employment status				
Paid work, employed				
Paid work, self-employed	0.078 (*)	1.91	0.284 **	3.31
Unemployed	-0.898 **	-15.08	-0.861 **	-11.21
Retired	-0.033	-1.00	-0.087 *	-2.26
In education	0.263 **	6.22	0.256 **	5.39
Housework, looking after children	0.046	1.30	0.234 **	3.25
Doing other work	-0.544 **	-8.51	-0.575 **	-7.81
Country characteristics				
GNI per capita (PPP), log			1.221 **	6.69
Average TV viewing time in country (min)			-0.010 **	-5.06
Year fixed effects	Yes		Yes	
Country/wave fixed effects	Yes		No	
Constant	6.922 **	56.46	-1.828	-0.94
Observations	127, 949		127, 949	
R-squared	0.25		0.20	

Notes: (1) OLS estimates with standard errors adjusted for clustering at country level.

(2) Dummy variables indicating missing observations for income, age, gender, country of birth, marital status, education, and employment status are not shown.

Significance levels: ** p≤0.01, * 0.01<p≤0.05, (*) 0.05<p≤0.1.

Data sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005), World Values Survey Wave 3 & 4 (European Values Study Group and World Values Survey Association 2006), IP Network (several years), World Development Indicators (World Bank several years).

In order to calculate the marginal effect according to the level of residual TV viewing, we specify a second extended life satisfaction function. In addition to the variables in the first equation, the number of TV channels available in a country is included in the regression. As this information is at a country/wave level, country/wave specific fixed effects can no longer be controlled for. Instead, we add the control variables gross national income (adjusted for comparative price level) in its logarithmic form log(GNI_j), as well as average TV viewing time $AvgTV_j$ in a country.[74] This leaves us with the following second specification:

$$LS_i = \beta_0 + \beta_1 ResidTV_i + \beta_2 log(N_j) + \beta_3 (ResidTV_i * log(N_j)) + \gamma_1 X_i + \gamma_2 log(GNI_j) + \gamma_3 AvgTV_j + \gamma_4 Y_t + \varepsilon_i$$

Column (B) in Table 13 shows the results for this specification. The interaction term between residual TV viewing and the number of TV channels is robust and again has the same size and statistical significance as in the previous specification. For further interpretation of the coefficients, mean adjustment of the number of TV channels and residual TV viewing time must be taken into account. The coefficient of the constitutive term number of TV channels (natural logarithm) is therefore estimated for TV consumers with an average residual (the ones in the 5th decile). It captures the marginal effect on life satisfaction if TV viewers have more channels to choose from. It is estimated to be negative (-0.04) but not statistically significant. From the latter coefficient and the interaction term, the marginal effects of the number of TV channels on life satisfaction can now be calculated for different levels of residual TV viewing. The calculations are presented in Figure 11a) together with the 90% and 95%-confidence interval.[75]

For people in the first decile of residual TV viewing time, i.e., those watching much less than predicted, having a higher number of TV channels to choose from has no impact on their life satisfaction. The marginal effect is close to zero. For people with above average residual TV viewing time, the marginal effect becomes negative and approaches statistical significance. Respondents viewing much more TV than predicted (10th decile) report ceteris paribus a 0.12

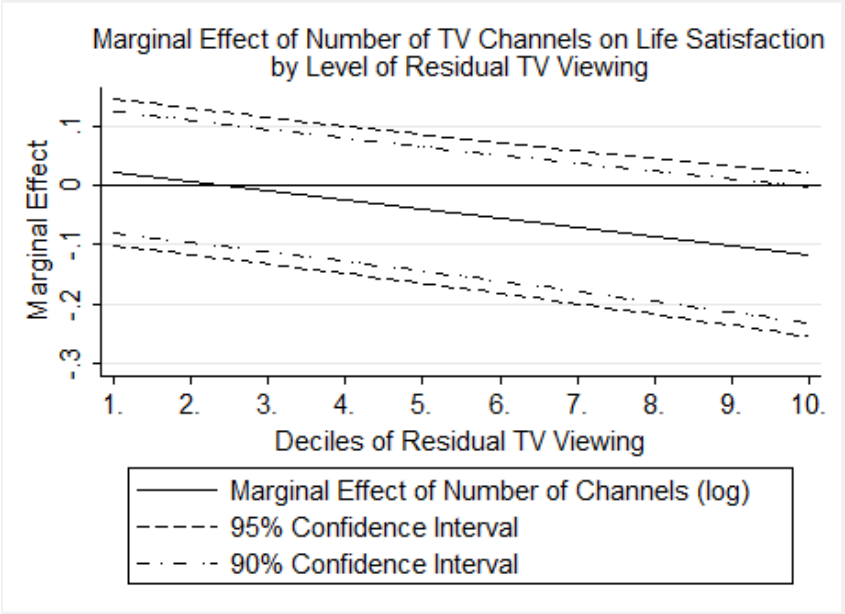
[74] Data for GNI are from the World Development Indicators (several years), and data for average TV viewing time are from IP Network (several years).

[75] For a discussion on the interpretation and presentation of interaction models see Brambor et al. (2006).

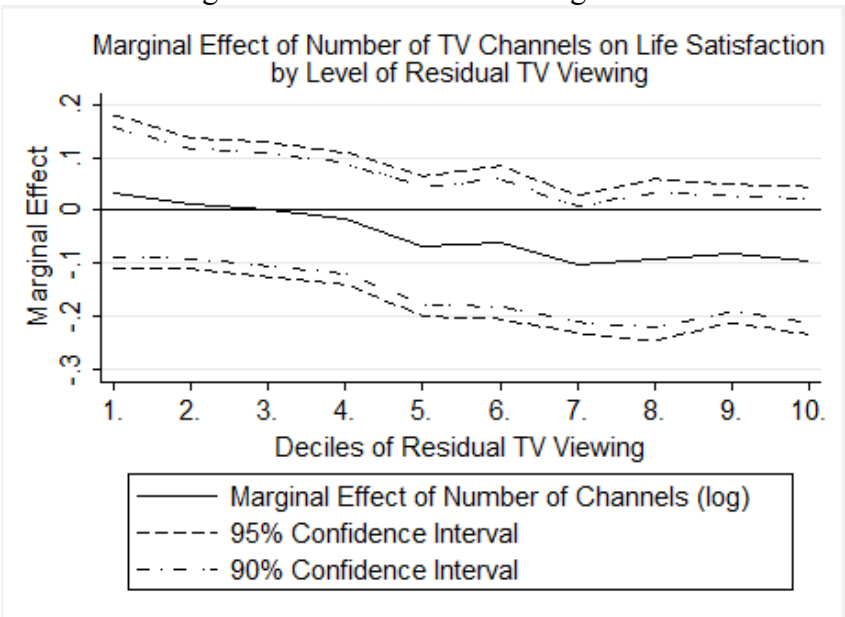
point lower life satisfaction (t-value=1.64) when, for example, living in a country with 10 TV channels compared to living in a country with only 3 TV channels. This effect is sizeable; it corresponds, for example, to one-fifth of the difference in life satisfaction between married and divorced people (-0.62).

Figure 11: Number of TV Channels and Life Satisfaction

a) Linear specification of residual TV viewing



b) Specification based on categories of residual TV viewing



We also estimate a more flexible specification (not shown in Table 13), allowing the marginal effect of additional TV channels to vary freely for each decile of residual TV consumption.

Figure 11b) presents the results of the more flexible specification, which includes dummy variables for each decile of residual TV consumption. The calculated marginal effects of additional TV channels on life satisfaction show a similar pattern and magnitude to the more rigid specification.

Thus, heavy TV viewers not only seem to benefit less from additional TV channels, but also to experience a reduced level of life satisfaction. This finding is not consistent with a universe of sovereign TV consumers benefiting from a larger choice set. Rather, the finding suggests heterogeneity in self-control and is consistent with the view that part of observed individual TV consumption is due to a lack of willpower when exposed to the temptation of satisfying immediate pleasure. Referring to our graphical analysis in chapter 3.2, on average around 10% of the respondents (taking the 90% significance level as a cutoff point) do not experience a net benefit from an increase in the number of TV channels, i.e., area CHEF is larger than BHG.

3.6.3. Robustness

In our robustness analysis, we address two alternative explanations for the observed patterns in the correlation between TV viewing and life satisfaction in relation to the number of TV channels. The first alternative questions the representativeness of the measure on the number of TV channels for the group of heavy viewers. A spurious negative correlation for the interaction term could emerge if the following scenario were to occur: in countries with few TV channels, on average, only the rich and happy can afford satellite TV, have more channels than normal and therefore also watch more TV. In contrast, in countries where almost everyone has cable or satellite TV, people who watch a lot of TV tend to be unhappy, lonely or unemployed. Across countries, heavy TV viewers would seem less satisfied with more channels. Another alternative explanation suggests that TV markets with many channels rather than a few channels differ in other respects than just program variety. A concern about the documented relationship between TV channels and life satisfaction is therefore that it actually reflects some differences between media markets rather than suboptimal decisions by some individuals.

Measures of the number of TV channels

Our measure for the number of TV channels, i.e., the number of TV channels received by 70% of the population as published by IP Network, is arbitrary to some extent. All the same,

it probably provides a good approximation of the average choice of TV programs in a country. Moreover, it is exogenous to individual choice, which fits the design of our empirical test. However, it does not take into account the variance of the number of TV channels within a country.

This aspect disturbs our testing strategy if (i) the number of TV channels at the individual level is correlated with individual TV viewing time and life satisfaction within a country and (ii) this correlation is systematically different between countries with a low aggregate number of TV channels and countries with a high aggregate number. In the scenario mentioned above, the happy heavy viewers in the (poor) countries with few TV channels might then be compared with the unhappy heavy viewers in the (affluent) countries with many TV channels. It is important to note, though, that any such effect needs to go beyond the individual characteristics (like income) controlled for in the estimation equations, determining the heavy viewers *separately* for each country sample.

In our first robustness check, we aim at compiling country samples of individuals for whom the information on the number of TV channels is representative. We do this by excluding observations at the tails of the distribution of residual TV viewing time, taking into account information on market penetration with terrestrial, cable and satellite TV. The following procedure is applied. Households with only terrestrial TV usually have access to just a few channels, while the offer is larger for households with cable or satellite TV. If 70% or more of the households in a country only have terrestrial TV, the measure on the number of TV channels available is probably sufficiently accurate for these households. However, it is not accurate for the households with cable or satellite TV. In this case, the percentage of respondents with cable or satellite TV is excluded from the analysis (i.e., the respective percentage of respondents with the highest residual TV viewing time). Accordingly, if 70% or more have access to cable or satellite TV, we exclude the percentage with only terrestrial TV (i.e., the respective percentage of respondents with the lowest residual TV viewing time).

The exclusion procedure is thus based on the assumption underlying the alternative hypothesis that the individual number of TV channels and individual (residual) TV viewing time are positively correlated within a country.

Data on terrestrial cable and satellite diffusion are from IP Network and shown in Table A5 in the Appendix. The fraction of people who only have access to terrestrial TV in our data base is smallest in Luxembourg and the Netherlands (around 1%), and largest (in the early surveys)

in Brazil (89%), the Ukraine (93%) and Greece (99%). Table 14 presents the regression results after the samples have been adjusted. The number of country samples drops from 76 to 73 as the specific data is not available for 3 countries.[76] The number of observations drops from 127,949 to 88,424 due to the exclusion criteria described above.

Table 14: TV Consumption, Number of TV Channels and Life Satisfaction: Country Samples Adjusted for the Diffusion of Terrestrial, Cable and Satellite TV

Dependent variable:	A		B	
Life satisfaction	Coefficient	t-value	Coefficient	t-value
Decile of residual TV viewing (5^{th} decile=0)	-0.006	-1.48	-0.006	-1.35
log (number of TV channels, mean adjusted)			-0.097	-1.51
Decile of residual TV viewing * log (number of TV channels)	-0.022 **	-4.36	-0.022 **	-4.30
Individual control variables	Yes		Yes	
Control variables at country level	Yes		Yes	
Year fixed effects	Yes		Yes	
Constant	8.388 **	47.32	-2.408	-1.25
Observations	88,424		88,424	
R-squared	0.26		0.22	

Notes: (1) OLS estimates with standard errors adjusted for clustering at country level.

(2) Individual control variables are the same as in Table 13 and include income (deciles), age, age squared, gender, whether born in the country of residence or not, marital status, education, and employment status, as well as dummy variables indicating missing observations for income, age, gender, country of birth, marital status, education, and employment status.

(3) Control variables at country level are the same as in regression B in Table 13 and include log GNI per capita (PPP) and average TV viewing time.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005), World Values Survey Wave 3 & 4 (European Values Study Group and World Values Survey Association 2006), IP Network (several years), World Development Indicators (World Bank several years).

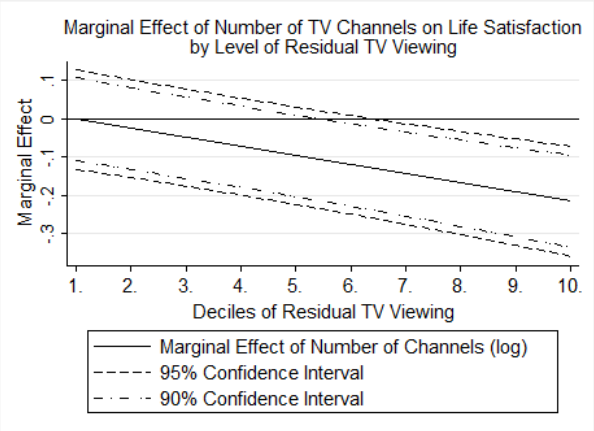
The same specifications as in Table 13 are estimated. It is found that the results are robust to the adjustment of the samples. The estimated coefficient for the interaction term is even larger in absolute terms (0.22) than in Table 13. Figure 12 shows the marginal effects of additional TV channels on life satisfaction. They are large, negative and statistically significant at the

[76] The 3 country samples excluded are Macedonia, the Czech Republic, and Mexico for WVS 3. The difference between the results in Table 1 and Table 2 is not mainly due to this difference in observations.

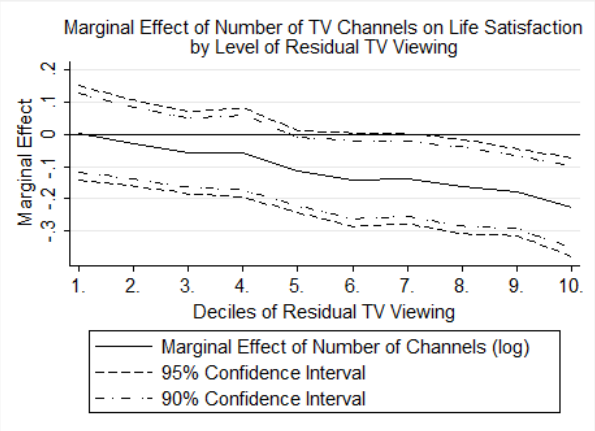
95% level for intermediate and high levels of residual TV viewing time. Thus, the findings for the full country samples cannot easily be explained by differences in the diffusion of different TV technologies.

Figure 12: Number of TV Channels and Life Satisfaction Adjusted for Terrestrial, Cable and Satellite Distribution

a) Linear specification of residual TV viewing



b) Specification based on categories of residual TV viewing



Young adult viewers and female viewers

The second robustness test looks at an alternative explanation of the partial correlations in terms of differences in media markets. In countries where people have access to more TV channels, TV markets tend to be less regulated and (annoying) commercial time might be higher. Some theoretical models of TV markets show a trade-off between diversity (i.e., number of channels) and the average quality of programs. In a population with heterogeneous preferences, some groups might therefore lose from an increased choice of programs (see, e.g., Liu et al. 2004; Anderson and Coate 2005; Liu et al. 2006). Furthermore, there might be social costs associated with increased TV viewing due to having more channels, even if the individual viewing choice is rational (see e.g. Putnam 2000; Corneo 2005).

Many of these possible market differences will affect heavy and light viewers alike and do not undermine our empirical test which is based on an interaction hypothesis. However, some differences might mainly impact individuals with a high preference for TV viewing. To address this concern, we run our regressions for different subgroups of the population.

It is well-documented that in highly competitive TV markets, with many channels available, the programs are tailored to viewer groups of particular interest to advertisers (see, e.g.,

Hamilton 2004 for a comprehensive discussion). These are mainly young adult viewers (18 to 34 years old) and female viewers (being the "main purchase responsibles" in a household). In contrast, in less competitive markets with fewer channels, and to a large extent government or license fee financed channels, programs possibly cater for broader viewer groups. The young adult viewers and female viewers should thus gain the most – or lose the least – when more channels are available. If the negative relationship between the number of TV channels and life satisfaction for heavy viewers is due to omitted market characteristics, rather than a lack of individual self-control, the relationship should be less pronounced or non-existent for these groups.

Table 15: TV Consumption, Number of TV Channels and Life Satisfaction of Young Adult Viewers and Female Viewers

Dependent variable: Life satisfaction	Young adult viewers (18-34)		Female viewers	
	Coefficient	t-value	Coefficient	t-value
Decile of residual TV viewing (5^{th} decile=0)	-0.014 **	-3.18	-0.012 **	-3.27
log (number of TV channels, mean adjusted)	-0.096 (*)	-1.69	-0.043	-0.65
Decile of residual TV viewing * log (number of TV channels)	-0.015 **	-3.55	-0.016 **	-3.83
Individual control variables	Yes		Yes	
Control variables at country level	Yes		Yes	
Year fixed effects	Yes		Yes	
Constant	0.469	0.27	-3.320 (*)	-1.70
Observations	40,733		67,760	
R-squared	0.20		0.21	

Notes: (1) OLS estimates with standard errors adjusted for clustering at country level.

(2) Individual control variables are the same as in Table 13 and include income (deciles), age, age squared, gender, whether born in the country of residence or not, marital status, education, and employment status, as well as dummy variables indicating missing observations for income, age, gender, country of birth, marital status, education, and employment status.

(3) Control variables at country level are the same as in regression B in Table 13 and include log GNI per capita (PPP) and average TV viewing time.

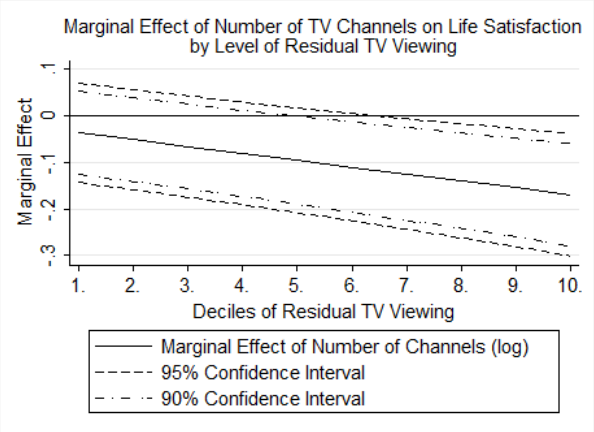
Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005), World Values Survey Wave 3 & 4 (European Values Study Group and World Values Survey Association 2006), IP Network (several years), World Development Indicators (World Bank several years).

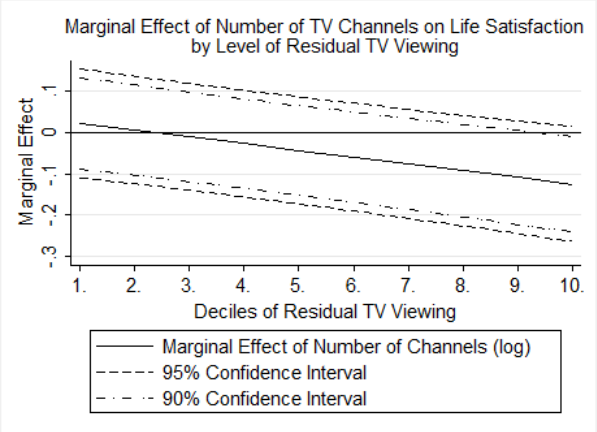
Table 15 presents the regression results for the specified age and gender groups. In comparison to the estimates for the whole population in Table 13, the size and the statistical significance of the coefficients hardly change when looking only at young adult viewers (first regression in Table 15) or female viewers (second regression in Table 15). If anything, the marginal effect of the number of channels on life satisfaction for heavy viewers tends to increase and becomes statistically significant at higher levels (see Figure 13).

Figure 13: Number of TV Channels and Life Satisfaction of Young Adult Viewers and Female Viewers

a) Young adult viewers



b) Female viewers



This finding runs counter to the alternative explanation in terms of rational TV consumers, that differential effects of additional TV channels benefit some heavy TV viewers while harming others. The groups most likely to benefit, young adult and female viewers, who spend a lot of time watching TV, actually report lower life satisfaction when they have access to more channels. The finding thus lends further support to the hypothesis that unpredictably heavy TV viewers face a problem of limited self-control when making their consumption decisions.

3.7. Concluding Remarks

Rational choice is probably an appropriate characterization of a large fraction of observed behavior. However, TV consumption might pose a challenge that could be considered particularly relevant because TV is one of the most time-consuming activities of people in today's world: in many countries, over their entire lives, people spend, on average, as many hours watching TV as they do working (Corneo 2005). Hardly anyone would deny that watching TV provides pleasure, at least some of the time, and that it is an important source of information. However, many people report that they would like to spend less time watching TV. Observed consumption behavior might thus be a weak indicator for the pleasure individuals derive from TV viewing.

This part of the thesis therefore addresses the issue that long hours of TV viewing may indicate imperfect self-control, as well as misprediction of the long-term costs of TV consumption, reducing individuals' utility. The empirical results show that long hours of TV viewing are associated with lower subjective well-being. This negative relationship is especially strong for people with high opportunity costs of time and for those having access to a large choice of TV channels. Hence, our research suggests that some people are not able to optimally trade off the benefits and the (future) costs associated with television consumption.

Our analysis is an explanation of the amount of TV consumption rather than of marginal reactions due to changes in relative prices. Valuable insights can be gained from going even further in this direction. In fact, the understanding of how people allocate their time and why they allocate so much time to television consumption is of further relevance when one considers the important role television may have in the political process. The next part of the dissertation explores this issue and analyzes the impact of television on voters and politicians.

4. Television and the Behavior of Voters and Politicians

4.1. Introduction

Mass media play a unique role in transmitting information to voters and in shaping their political attitudes. The diffusion of free, non-partisan media during the last centuries is regarded as crucial for the development of functioning democracies. Gentzkow et al. (2006) relate "the Rise of the Forth Estate" in the US, i.e., the development of the non-partisan press in the 19th century, to the sharp decline of corruption in that era.

The 20th century saw even more radical changes in the media landscape with the introduction and rapid diffusion of radio, television and the internet. In fact, radio and TV are the technical inventions of the 20th century with the highest diffusion rates (Bowden and Offer 1994). As has been shown in the previous chapters, today, television is by far the most important and time-consuming kind of media. Europeans spend on average over 3 hours a day watching TV and US Americans even about 5 hours (IP Network 2006).[77]

Despite the prevalence television in the lives of people, little is known about causal effects of television consumption on the behavior of people in the political sphere. Exceptions are the few studies (Gentzkow 2006; Oberholzer-Gee and Waldfogel 2009) that convincingly show - negative and positive - effects of television on voter turnout. Prat and Strömberg (2005) analyze the effect of the introduction of private TV in Sweden on voter information, and Olken (2008) shows that better TV signal reception in Indonesian villages due to topographical differences is related to lower participation in local government activities but not to measures of village governance. Most other studies of the effects of media on the political process use data on newspapers or on general media freedom, rather than on television, as data on the former are more readily available. Furthermore, actual TV consumption or media consumption, in general, only receives scarce attention. The analysis of the effects of media consumption on behavior faces the problem that media consumption is

[77] These figures not only relate to the information function of television, but also to its entertainment function. However, data from the European Social Survey also show the dominance of television when only concentrating on news consumption. More than 40% of respondents watch more then 1.5 hours news on TV daily, while only about 30% spend so much time on listening to the news on radio and only 20% on reading newspapers (see chapter 2.4.1).

endogenously chosen. Hence, people who are more interested in politics and who participate more in the political process are also expected to inform themselves better and to consume more news. Therefore, most studies use supposedly exogenous variation in media supply and directly analyze its effects on some outcome variable (see also the discussion in chapter 2.2.3).

To empirically address a possible causal relationship between television and behavior of voters and politicians, I use a similar procedure but also include TV consumption directly into the analysis. I compiled both cross-sectional and panel data sets on the diffusion of local television in Switzerland. This country is an ideal setting for an empirical analysis of the effects of TV consumption on the behavior of voters and politicians. Due to the country's federal structure, important political decisions are made at state or community level. This, in combination with the presence of direct democratic institutions, places great importance on local political information and therefore on local media. Moreover, the supply of local television varies to a large extent over regions and over time. The empirical results show that voters, as well as politicians, systematically react to the presence of local television. Hence, television should be taken seriously as a separate force in the political process.

Two major aspects of TV are highlighted in the empirical analysis. Local TV attracts different socio-economic groups than other media like newspapers and radio. People with low education are more likely to watch TV news when local TV is available. This effect is found in areas where local TV markets match well with jurisdictions. For people with higher education, news consumption does not differ with the availability of local TV. More importantly, people react to the consumption of local TV news by increasing their participation in federal elections. Again, this effect is much more pronounced for people with low education than for those with high education and limited to areas where local TV markets correspond to one jurisdiction or electoral district. When local TV markets span over several jurisdictions there is no statistically significant effect of the availability of local TV on news consumption and on voter participation. The presence of these differentiated effects lends support to the proclaimed direction of causality from TV to behavior.

The second aspect that distinguishes TV from more traditional media is the transmission of information not only via words but also via moving pictures. Therefore, in comparison with information in newspapers and on radio, person-related information becomes more important than factual information. Hence, the role of individual politicians is increasing in comparison to the role played by parties and their political programs. The empirical results show that

parties - especially small ones with negligible chance of being elected into the Council of States (the small chamber of the federal parliament with two representatives from each full canton) - nominate more candidates when local TV is available. Again, this effect is stronger in regions with a good match between local TV markets and electoral districts and it is confirmed in cross-sectional as well as panel data.

Hence, this part broadens the perspective taken in the previous parts of the thesis. We not only look at TV consumers but also analyze the effects TV can have on other actors, in this case politicians. Chapter 4.2 reviews the economic literature on media institutions and their effects on the behavior of voters and politicians. Chapter 4.3 discusses the differences between TV and other news media and presents the existing empirical literature. The local TV market in Switzerland is described in chapter 4.4, while chapter 4.5 presents the empirical analysis of local TV on voters and chapter 4.6 the empirical analysis of local TV on politicians. Chapter 4.7 concludes.

4.2. Media and Politics

The ability of voters and interest groups to enforce their preferences in the political process and to effectively control government depends, among other institutional settings, on the information available to them, and on the cost of information respectively. Interest groups with concentrated benefits will be able to organize themselves and keep themselves informed, exerting pressure on politicians. In contrast, consumers or taxpayers with dispersed interests will have little individual incentives to inform themselves and will therefore not receive favorable policies (Olson 1965). Mass media may attenuate this bias, "since they provide politicians with a megaphone that reaches exactly the large, dispersed consumer groups" (Strömberg 2002, p. 97). Mass media decrease the information costs of large, unorganized interest groups.

Politicians are therefore expected to react to the extent of media distribution and the amount and kind of media that voters consume. Politicians bias government policies in favor of informed voters. Strömberg (2004b) shows empirically that the diffusion of radio in the US led to an increase in government spending in counties with more radio access. Similarly, Bruns and Himmler (2008) provide evidence that government spending is higher in counties closer to media cities because reporting from these locations is less expensive. Yet, not all groups are equally important for media firms. News, especially that of TV channels which are almost exclusively financed through advertising, will be tailored to groups with characteristics valuable for advertisers (see e.g Hamilton 2004). Strömberg (2004a) analyses theoretically how increasing-returns-to-scale technology and advertising financing of mass media leads to policies favorable to large groups and groups valuable to advertisers. Other authors analyze more generally the effects of free media on different political and economic outcomes. Private ownership of the media, press freedom and low concentration in the media market are associated, for example, with better government accountability (Besley and Prat 2006), less corruption (Brunetti and Weder 2003) and more political rights and better social outcomes (Djankov et al. 2003). This is due to voters consuming more news, being better informed about politics and being politically more active in countries with freer media (Leeson 2008).

Yet the diffusion of new media is also subject to worries and criticism. Putnam (2000) relates the sharp decrease of social capital, civic engagement and political participation in the US to the diffusion of television (see also Gentzkow 2006). Sunstein (2001; 2007) fears that the internet and its possibility to filter information may have negative effects on extremism and the functioning of democracy. The discussions of Becker et al. (2007) or Trappel (2008), who

argue that media freedom is not the only aspect important in modern democracies, go in a similar direction. Other elements such media diversity, media accountability, and media's support of deliberation are relevant as well.[78]

In any case, not only the absence or presence, or the amount of, free media influence the political process, but also the organization of media markets and other institutional settings can affect the behavior of voters and politicians. Snyder and Strömberg (2008) show that a better match or congruence between media markets and congressional districts leads to voters knowing more about their representatives and to politicians being more responsive to voters' needs. The geography of media markets also affects the political process in a further manner. The spread of national media leads to less local news being consumed and to lower local voter turnout among target groups. George and Waldfogel (2006; 2008) show that the expansion of the *New York Times* decreases local newspaper readership among college graduates targeted by the *Times* and leads to them being less likely to vote in local elections. Localism is not only affected by newspapers but also by television. The presence of local TV news in Spanish increases Hispanic voter turnout in the US by 5 to 10 percentage points, relative to non-Hispanic voter turnout (Oberholzer-Gee and Waldfogel 2009). While the integration of media markets may lead to more choice and better preference satisfaction for consumers, it can also undermine local civic engagement.

In sum, existing studies show that media play an important role in the political process and that the organization of media markets can shape the specific impact the media have on voters and politicians. The next section discusses the specific roles of different types of media and specifically addresses how TV differs from other kinds of media.

[78] Another important aspect is, of course, the amount, causes, and consequences of media bias (see, e.g., Eichenberger and Serna 1996; Mullainathan and Shleifer 2005; Baron 2006; Gentzkow and Shapiro 2006; Reuter and Zitzewitz 2006; Gerber et al. 2009).

4.3. Is Television Different from Other Types of Media?

Television features some obvious differences from other types of media, especially newspapers, due to technological reasons. Since the development of satellite technologies, TV has been able to broadcast events live from any corner of the world. This is not possible for newspapers.[79] Another difference lies in the feature of TV news being limited by time while newspapers have limited space (and, typically, TV news are more limited). This leads to the inclusion by TV news of less and less detailed – and maybe more understandable – information. In contrast to newspaper readers, TV viewers cannot control the pace at which they receive and process information unless the broadcasts are recorded (Druckman 2005). Further important differences concern the significance of visual aspects. The need to combine words with (moving) pictures on TV may lead to a completely different news product. Personalization and emphasis on emotional aspects may be the result.

While many authors just assume television is different and even ascribe changes in political campaigning over time to the expansion of TV, especially of private stations (see e.g. Bean and Mughan 1989, p. 1168, 1175; and the discussion in Schoenbach 1996, p. 92-93), there is little empirical evidence that television content really differs from other media content. Many studies that empirically analyze, for example, personalization and tone of political news look at trends over time in one type of media and do not compare television to other media (see e.g. Sigelman and Bullock 1991; Patterson 1993, p. 113-115; Wattenberg 1996; Wilke and Reinemann 2001). The few studies that do compare TV news to newspaper content present mixed results. Semetko and Valkenburg (2000) show in a cross-section of Dutch media that TV news are more personalized than newspapers in the sense that they more often use a human interest frame, i.e., bring "a human face or an emotional angle to the presentation of an event, issue, or problem". Yet differences between types of outlets are larger than between types of media. Druckman (2005) analyzes how local newspapers and local TV stations cover the 2000 Minnesota Senate campaign. While there are large differences in quantity of coverage (i.e., newspapers covered the senate campaign on 88% of the days coded while TV did so only on 34%) the differences in content style are rather small. Particularly, there are no differences in personalization between media types and only moderate differences in the use

[79] However, radio has the same possibilities and with the increasing diffusion of internet this feature has become less of a comparative advantage of TV.

of issue frames (i.e., newspapers use an issue frame in 31% of analyzed cases and TV in 21%).

Even though these studies usually content analyze entire newspapers, they typically only examine TV news while disregarding other broadcast with political content. However, many TV stations feature regular discussion programs on political issues. Furthermore, TV debates between candidates have become an important aspect of election campaigns. This importance is also reflected in the usually extensive post-debate coverage, not only on TV, but also in newspapers (Reinemann and Wilke 2007). While candidates of course talk about political issues in a TV debate, the focus is on them as a person. It could therefore be argued that such TV formats represent the clear differences between TV and newspapers.[80] Even if content analyses show no systematic differences between news on television and newspapers, TV probably focuses more on politicians than it does on policies, parties or other factual information.

Consequentially, the impact that this different coverage of politics on TV has on politics, or more concretely, on the behavior of voters and politicians, can be analyzed. Prominent in communications research is the mediatization or mediation hypothesis (see, e.g., Blumler and Kavanagh 1999; Schulz 2004), which states that due to the rise of mass media, and especially TV, "the media have been moving to centre of the political process […] altering the behavior of candidates, the parties' campaign organization and the behavior of the electorate" (Schulz et al. 2005, p. 56). Central themes in empirical studies in this research field are the professionalization and personalization of political campaigns and their effects on citizens. Two main types of empirical studies can be distinguished. Analogous to, or even in connection with, analyses of media content, a first type of study investigates changes over time. Again, results on personalization of voter decisions, for example, are mixed and rather than showing a consistent time trend voters' use of criteria to evaluate parties and candidates seems to be context specific (see, e.g., Schulz et al. 2005). A second type of study focuses more on media consumption and compares newspaper readers to television viewers. TV viewers know less about politics than newspaper readers,[81] base their voting decisions more

[80] Of course, newspapers also print interviews with politicians. Yet, interviews usually do not use a large part of newspaper space and are typically included in the content analysis of newspapers.

[81] The same also applies when comparing viewers of public TV channels to viewers of private channels (Holtz-Bacha and Norris 2001).

on criteria relating to the politician as a person as compared to her stand on political issues (e.g. Keeter 1987), their voter turnout is lower, and they are less interested in politics. It is however difficult to infer a causal effect of TV consumption on knowledge and behavior. Different types of people rely on political information from TV than from newspapers. Among other factors, TV viewers are less educated than newspaper readers, earn less and are less interested in politics (see, e.g., the discussion in Graber 2006, 183-184).

It is therefore difficult to assess in which direction the causal relationships run. How would it be possible to ascertain whether, for example, people with less political knowledge watch more TV or if TV imparts less knowledge than newspapers do? One might have to analyze exogenous changes in television supply. Prat and Strömberg (2005) use exactly this approach in their analysis of private TV on voter information in Sweden. They show that the introduction of private TV in Sweden benefited the young and the less informed that previously used few other news sources (e.g. public television). After the introduction of private TV, this voter group began watching private TV news, obtained significantly higher knowledge and thus increased participation in politics. The analysis is based on panel data, i.e., the same people are surveyed before and after the introduction of the private channels, and allows for a causal interpretation of the results. It is also interesting to note that the results of Prat and Strömberg confirm previous cross-sectional results which found that better informed people are more likely to watch public TV, while worse informed groups are inclined to watch private TV. Yet, the interpretation is not, as in many cross-sectional studies cited above, that (commercial) television has a negative impact on citizens' knowledge. On the contrary, less informed people who are not attracted by other media gain from private TV (see Prat and Strömberg 2005, p. 4). It is therefore suspected that many cross-sectional results comparing newspaper readers and TV viewers, for example, cannot be interpreted causal.

Some other studies allow for causal inferences of TV on political participation. Gentzkow (2006) analyzes the introduction of television in the US that occurred in different regions at a different point of time due to exogenous, i.e., technical, reasons. His results are more pessimistic and show that TV reduced voter turnout considerably, due in large part to its negative impact on newspaper readership. Oberholzer-Gee and Waldfogel (2009) use cross-sectional as well as panel data, and their results are based on the comparison of different voter groups with different access to TV. They show that voter turnout of Hispanics in the US in areas with local TV news in Spanish compared to the voter turnout of Non-Hispanics is much higher than in areas without news in Spanish. Using cross-sectional data, Olken (2008)

analyzes exogenous differences in TV supply in Indonesian villages due to topographical reasons. He finds a negative impact of TV on attendance in town meetings. All these studies do, however, not include TV consumption in their analysis.

Why do some studies find negative effects and other studies positive effects of TV on political participation? Of course, TV does not usually enter into a setting where citizens did not have prior access to any media or political information, and media markets vary considerably between countries and times. The impact of TV might therefore depend on the complex substitutive and complementary relationships between the different types of media and between media with a different degree of local content. Specifically, the spread of television in the first half of the last century led to entertainment becoming relatively cheaper than news and, because TV coverage was mainly national, to a crowding out of local news consumption. In contrast, today, where people in most developed nations have access to a vast choice of entertainment TV, an increase in (local) TV news supply might have a rather positive impact on civic engagement. Another reason for the differing results might be, as Prat and Strömberg (2005) show, that the effect of TV differs for different populations groups, especially as TV targets different population groups than newspapers, for example.

Here, it is hypothesized that the less educated or previously ill informed profit from television presenting news in a simpler[82] and more personalized way than traditional (print) media. Having a type of news media that better meets their needs may lead to them consuming more news and being better informed. Better information should decrease the probability of making a wrong voting decision and increase political participation.

Second, it is hypothesized that due to the dominance of the moving picture television news carry more person, i.e., politician, related information than factual information on policies and party programs compared to newspapers and radio. Political parties react to the presence of TV by increasingly putting individual politicians in the center of their parliamentary election campaigns instead of party programs. More parties will nominate candidates for elections in which the candidates themselves and not the parties and their programs attract the most media attention.

[82] An additional effect might come from the fact that news on local TV in Switzerland are presented in Swiss German dialect while news on national public TV and in Newspapers are in High German, which can be difficult to understand for some people, e.g. for those with low education.

The above hypotheses are tested using data on the presence of local TV news in Switzerland. Cross-sectional data are used and extended with panel data where possible. The empirical analysis distinguishes between TV channels serving only one canton, i.e., sub-national jurisdiction and electoral district for federal elections, ("cantonal stations") and TV channels covering several cantons ("intercantonal stations"). The effects of local TV news on the behavior of voters and politicians are expected to be stronger when television news are targeted at one jurisdiction and political debates on TV present the candidates of one electoral district only. The next section describes the local TV market in Switzerland in more detail.

4.4. Local Television in Switzerland

Television in Switzerland is heavily regulated. All Swiss programs need a concession from the *BAKOM*, the federal telecommunications and broadcasting authority.[83] The Swiss television market is dominated by the public-broadcasting company *SF Schweizer Fernsehen* and its six license fee financed TV stations (two in German, two in Italian, two in French). However, most Swiss households also receive and watch many foreign channels, especially those from the surrounding countries, Germany, Austria, France and Italy (IP Network 2006).

Domestic private television stations offering comprehensive programming only began developing during the mid 90s. The only two private *national* channels that started during the 90s were (financially) unsuccessful and ceased operations after a few years. Today, only channel *3+*, which started broadcasting in 2006, is still active. The local television market is, however, much more active than the national market. According to data from the *BAKOM*, in 2006, 18 private local or regional TV stations offered comprehensive programming with daily news broadcasts and 9 more stations offered weekly programming. Fifty more providers were in possession of a concession but only offered videotext or sporadic shows, e.g. before local elections.

Local TV stations are licensed to distribute their program in a clearly defined territory, sometimes comprising several communities and often one canton[84] or (parts of) several cantons. They can only be received via cable.[85] Terrestrial distribution or satellite distribution is usually not allowed.[86] In their daily news and special broadcasts before elections, these TV stations focus on regional issues happening in their broadcasting area. *TeleZüri*, the channel that can be received in the whole canton of Zurich, states on its homepage that its daily news broadcast, the *ZüriNews*, covers up-to-date news stories focusing on the area of Zurich. Similarly, *Tele Ostschweiz*, a channel broadcasting in 4 cantons in the eastern part of Switzerland, writes on its homepage that it covers "the most important news from the cantons

[83] As the data used in this chapter is for the period 1990-2007, this and the following information relates to the situation before April 01, 2007, when a new radio and television law with less strict concession requirements was enacted.

[84] Swiss cantons are the equivalent to US states.

[85] 82% of Swiss households have access to cable TV (IP Network 2006).

[86] There exist two exceptions to this rule. The stations "Léman Bleu" and "TeleSüdostschweiz" are also transmitted terrestrially in the canton of Geneva and in the canton of Graubünden, respectively.

of Appenzell Innerhoden, Appenzell Ausserrhoden, St.Gallen, and Thurgau". These two examples reveal that local TV stations can be divided in two broad categories. "Cantonal stations" relate to one specific jurisdiction (canton), while "intercantonal stations" cover several jurisdictions (cantons). Each channel can been assigned to one or several cantons according to its area of distribution and its mission statement (i.e., which areas it mainly covers in its daily local news) and classified as "cantonal or "intercantonal". *TeleZüri*, for example, aside from being available within the majority of the canton of Zurich, may be watched in some bordering communities of the cantons of Aargau, Glarus and Schwyz. Yet, it is only assigned as a cantonal station to the Canton of Zurich and not to the other cantons, as its main distribution area lies within the canton of Zurich and its news cover only the area of Zurich.

In Switzerland, many political decisions, including tax issues, are made at cantonal level and cantons correspond to electoral districts for federal parliamentary elections. Voters in cantons with a cantonal TV channel will probably receive more information relevant for their political decisions trough local TV than voters in cantons with intercantonal TV.[87]

Table 16 presents data on local TV in Swiss cantons for all federal election years since 1990. There exist no (official) statistics on the diffusion of local TV in Switzerland. The data have therefore been compiled using information from the BAKOM, the TV channels themselves and several newspaper archives. In 1994, *TeleZüri* was the first local TV station to start broadcasting daily up-to-date news programs.[88] During the 1991 federal elections, voters were restricted to information from newspapers, radio and the national TV programs. In 2007, when the last federal elections took place, voters in 23 of 26 cantons were able to receive local television. Voters in 9 cantons had access to cantonal TV, and voters in 14 cantons had access to intercantonal TV.

[87] This distinction between cantonal and intercantonal channels is similar to the one Snyder and Strömberg (2008) make in their analysis of newspaper readership on politicians' behavior. They look at the congruence or match between media markets and congressional districts. They show that newspaper coverage of representatives is higher in areas with a better match between media markets and congressional districts and voters are therefore better informed. Similarly, Gentzkow (2006) shows that the negative effect of spread of television on voter turnout in the US is higher in TV markets fragmented into more congressional districts.

[88] Before that, several stations existed which, however, did not broadcast daily news. In my empirical analysis I consider only those programs that offer news at least Monday to Friday.

Table 16: Local Television in Switzerland 1991-2007

Number of cantons receiving local TV	Year				
	1991	1995	1999	2003	2007
No local TV	26	23	13	3	3
Cantonal TV	0	3	7	9	9
Intercantonal TV	0	0	6	14	14

Data Source: Own compilation based on information from BAKOM, TV stations, and several newspaper archives.

However, as local TV channels can only be received through cable, diffusion is not uniform within cantons. Depending on the share of households connected to cable and the cable operator serving a community, diffusion varies considerably within cantons. Some communities do not have access to local TV at all, either because the cable operator does not distribute the channel or because some channels are only licensed to distribute their program within a specific part of a canton.

For the year 2007, detailed data on the diffusion of local TV in Swiss communities have been compiled using information from *SuissImage*, the Swiss Authors' Rights Cooperative for Audiovisual Works.[89] Table 17 presents data on the diffusion of local TV in 2007 for each of the 26 cantons separately. TV stations are again classified as either "cantonal" or "intercantonal". In the cantons with cantonal TV the diffusion is lowest in the canton of Vaud where 35.5% of communities receive local TV and highest in the canton of Aargau where 90.8% of communities receive local TV. Among the cantons with intercantonal TV, Basel Stadt has the highest diffusion rate with 100% of communities receiving local TV and the canton of Graubünden the lowest diffusion rate with only 20% of communities receiving it. In the three cantons, Fribourg, Jura and Solothurn, there is neither cantonal nor intercantonal TV available.[90]

[89] Cable operators must report the number of their subscribers and the TV channels they distribute to *SuissImage* in order for *SuissImage* to calculate the tariffs for the use and distribution of protected audiovisual works.

[90] In some communities of these and other cantons, people receive local TV stations that focus their news programs on other cantons and regions. These communities are coded as not receiving any local TV news.

Table 17: Local Television in Swiss Cantons 2007

Canton	Share of communities		
	No local TV	Cantonal TV	Intercantonal TV
AG	9%	91%	0%
AI	17%	0.0%	83%
AR	15%	0.0%	85%
BE	33%	67%	0%
BL	9%	0.0%	91%
BS	0%	0%	100%
FR	100%	0%	0%
GE	58%	42%	0%
GL	64%	0%	36%
GR	80%	0%	20%
JU	100%	0%	0%
LU	19%	0%	81%
NE	19%	81%	0%
NW	0%	0%	100%
OW	14%	0%	86%
SG	8%	0%	92%
SH	28%	72%	0%
SO	100%	0%	0%
SZ	56.7%	0.0%	43.3%
TG	31.2%	0.0%	68.8%
TI	30%	71%	0%
UR	45%	0%	55%
VD	64%	35%	0%
VS	56%	44%	0%
ZG	0%	0%	100%
ZH	7.6%	92.4%	39.2%
	Share of communities		
Switzerland	46%	40%	18%
	Share of households		
Switzerland	21%	56%	28%

Notes: Each TV channel is assigned to one or more cantons. Communities / households receiving TV from another canton are classified as receiving no local TV. 66 communities in the canton of Zurich receive cantonal as well as intercantonal TV.

Data Source: Own compilation based on data from SuissImage.

4.5. The Effects of Local Television on Voters

4.5.1. Data and Empirical Strategy

The empirical analysis of voter behavior is based on the cross-sectional data on community level described above. Two different measures are used. First, I use dummy variables indicating if cantonal or intercantonal TV is distributed in a community. The reference group comprises respondents in communities without local TV news. The second measure additionally takes into account that the share of households having access to local TV stations via cable varies over communities. Data on local TV penetration is available for all 2721 communities in 26 cantons. The data are merged with individual level data from *Selects 2007*. In *Selects 2007*, 4392 people were interviewed in October and November 2007 shortly after the federal parliamentary elections. The survey includes questions on media consumption, political participation and voting behavior, opinion formation and many socio-demographic variables. The combination of the *Selects 2007* data with local TV data results in data availability for 4162 to 4230 individuals in 1135 communities and 25 cantons.[91]

For the analysis of media consumption, the following baseline specification is used:

$$NC_i = \beta_0 + \beta_1 TV_j + \gamma_1 X_i + \gamma_2 D_c + \varepsilon_i$$

The news consumption NC_i of individual i living in community j and canton c depends on the availability of local television TV_j in community j, on individual characteristics X_i, as well as on canton-specific effects D_c. For the dependent variable, news consumption, respondents are asked on how many days a week they usually watch the news on TV, read the politics section in their newspaper and listen to the news on the radio. The survey reveals that TV is the most commonly used source of news with respondents watching, on average, TV news 4.7 days a

[91] The total number of observations in *Selects 2007* is 4392. 159 respondents could not unambiguously be assigned to a community and are therefore missing data on local TV. 8 more respondents are missing data on the consumption of TV news, 37 on newspaper and 18 on radio consumption. 3 Respondents did not answer the question on election participation. The sample is further reduced when including interaction effects due to missing education data for 35 respondents and when using the share of households receiving local TV due to this information not being available for 28 respondents. There are no observations included in the survey for the canton of Nidwalden.

week (standard deviation 2.5). TV is followed by radio (average 4.5 days a week, standard deviation 2.9) and newspapers (average 3.7 days a week, standard deviation 2.7). For each of the three media types, separate regressions are run. While the main interest is in TV news consumption, the two other media consumption activities are used for robustness checks (see below). The individual control variables used in the analysis are age, sex, education, household income, household size (square root), marital status, employment status, time of residency in the respective canton, participation in the last federal election in 2003, and interest in politics as measured on a scale from 1 (not at all interested) to 4 (very interested). Table 18 presents the descriptive statistics.

Table 18: Descriptive Statistics Selects 2007

	Mean/share	Standard deviation
Local TV		
In a community with cantonal TV	54.2%	
In a community with intercantonal TV	31.7%	
Politics		
Participation in federal elections	68.9%	
Participation in last federal elections	74.9%	
Political interest [1-4]	2.8	0.85
Media consumption		
Days a week watching news on TV	4.7	2.5
Days a week reading newspapers	3.7	2.7
Days a week listening to news on radio	4.5	2.9
Individual/household characteristics		
Male	44.6%	
Female	54.4%	
Age	51.9	17.7
Household income (in 1000 CHF)	6.4	2.9
Household size	2.4	1.3
Marital status		
Married	52.8%	
Single	24.7%	
Divorced or separated	11.9%	
Widowed	10.5%	
Education		
No education / primary school	4.8%	
Compulsory education	7.2%	
Vocational education	41.4%	
Higher secondary school / voc. diploma	9.3%	
High school	5.8%	
High vocational education / college	17.8%	
University	13.7%	

Table to be continued

Continuation of Table 18

Employment status	
Working full-time	35.3%
Working part-time	21.1%
In training/formation	4.3%
Working in family business	0.6%
Working in household	8.1%
Retired	25.8%
Disabled	2.7%
Unemployed	1.3%
Doing other	1.0%
Residency in canton	
Up to 1 year	1.1%
1 to 3 years	2.1%
3 to 5 years	2.3%
5 to 10 years	5.7%
More than 10 years	88.7%

Data Source: Selects 2007 (Selb et al. 2008), and own compilation based on data from SuissImage.

In the second specification it is taken into account that the intensity of local political coverage, and therefore the effects of local television on voter behavior, might depend on the match between TV markets and jurisdictions. Therefore, penetration of cantonal television CTV_j and intercantonal television ITV_j are included separately into the regression. The same control variables as in the first specification are used.

$$NC_i = \beta_0 + \beta_1 CTV_j + \beta_2 ITV_j + \gamma_1 X_i + \gamma_2 D_c + \varepsilon_i$$

A third specification addresses the hypothesis that the effects of local TV on behavior might not be uniform over different population groups. Specifically, I test whether TV responds more to the needs of less educated people, and if less educated people consume more news when local TV is available. Again, I differentiate between cantonal and intercantonal TV and add interaction effects between both, cantonal and intercantonal TV and education to the estimation. The control variables are the same as in the previous specifications. The direct effect of education is included as well (in X_i).

$$NC_i = \beta_0 + \beta_1 CTV_j + \beta_2 ITV_j + \beta_3 (CTV_j * EDUC_i) + \beta_4 (CTV_j * EDUC_i) + \gamma_1 X_i + \gamma_2 D_c + \varepsilon_i$$

Similar specifications are used for voter participation:

$$PE_i = \beta_0 + \beta_1 TV_j + \gamma_1 X_i + \gamma_2 D_c + \varepsilon_i$$

$$PE_i = \beta_0 + \beta_1 CTV_j + \beta_2 ITV_j + \gamma_1 X_i + \gamma_2 D_c + \varepsilon_i$$

$$PE_i = \beta_0 + \beta_1 CTV_j + \beta_2 ITV_j + \beta_3 (CTV_j * EDUC_i) + \beta_4 (CTV_j * EDUC_i) + \gamma_1 X_i + \gamma_2 D_c + \varepsilon_i$$

For the dependent variable PE_i the respondents were asked if they participated in the last federal elections. 68.9% of respondents gave an affirmative answer. This is more than the actual voter turnout of 48.3%. A correction for this over-sampling does not change the general results.

Ordinary least squares (OLS) regressions are estimated for news consumption and probit regressions for election participation. Standard errors are clustered at the community level. As availability of and access to local TV news varies within cantons, canton dummies are included in the analysis. Therefore individuals within the same canton but in communities with different access to local TV are compared to each other.

This approach avoids most problems present in normal cross-sectional analyses in which TV viewers are compared to non-viewers. It might nevertheless be possible that communities with more or less access to local TV differ in other respects from each other. For example, there is less diffusion of cable and therefore of local TV in small rural communities. I therefore control as well for communities being urban or rural, community size and other community characteristics (22 point scale by the *Swiss Federal Statistical Office* capturing many aspects such as population dynamics, economic structure or prosperity). These community characteristics are captured with the term $COMCH_j$:

$$NC_i = \beta_0 + \beta_1 CTV_j + \beta_2 ITV_j + \beta_3 (CTV_j * EDUC_i) + \beta_4 (CTV_j * EDUC_i) + \gamma_1 X_i + \gamma_2 D_c + \gamma_3 COMCH_j + \varepsilon_i$$

$$PE_i = \beta_0 + \beta_1 CTV_j + \beta_2 ITV_j + \beta_3 (CTV_j * EDUC_i) + \beta_4 (CTV_j * EDUC_i) + \gamma_1 X_i + \gamma_2 D_c + \gamma_3 COMCH_j + \varepsilon_i$$

Despite many control variables, the variation of local TV within cantons could be endogenous to news consumption and political participation.[92] Within-canton variation of access to local TV comes from two sources. First, the license of a TV station sometimes only covers certain parts of a canton and second, cable penetration varies between communities.[93]

Regarding the first source of variation, it could be argued that TV stations only strive for a license in those parts of a canton where they expect people to attend to their programs and where people show sufficient interest and participation in politics. However, the argument has to be extended because here, it is hypothesized that local TV mainly affects the less educated. Advertising financed TV channels are interested in an audience with high purchasing power that generates high advertising revenues (see Hamilton 2004 for a comprehensive discussion of the argument). Therefore, a positive correlation between news consumption and political participation of the high earning and the high educated and local TV should be observed and not between news consumption and political participation of the less educated and local TV. Furthermore, different news consumption activities are usually shown to be positively correlated at the individual level, i.e., the politically interested consume on average more of all types of media than the politically indifferent. If local TV stations choose their distribution area based on the prospective audience, there should not only be a positive correlation between TV news consumption and local TV but also between other news consumption and local TV. I check this regressing not only TV news consumption but also newspaper and radio news consumption on local TV. Last, due to practical reasons, licenses often match with areas of cable operators. These areas follow economic reasons that are most likely not correlated with people's political participation and interest in local news.[94]

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[92] Of course, the same question arises regarding the variation of local TV between cantons. Here, endogeneity is much more likely than in the case of variation within a canton. It is, however, not a problem in the empirical analysis as canton dummies are included in the regression and therefore within-canton variation is used for the identification of the effects.

[93] Using the dummy indicator for local TV, the second source of variation only matters for the distinction between communities that do have cable TV and communities do not have cable TV at all. Using the second indicator for local TV the share of households in a community that has access to cable TV is taken into account as well.

[94] In Switzerland, many communities had their own communal cable operator or community antenna, or small private cable operators served local areas. While some of them still exist today, many of these local providers merged in the nineties.

Regarding the second source of variation, it could be argued that households buy access to cable TV when they are interested in local politics and therefore want access to local TV. However, cable diffusion in Switzerland mainly took place before local TV stations came into operation. In 1994, before the first local TV channel started its regular operation, 2.2 million households had access to cable TV. By 2007, the number had only risen to 2.9 million households.[95] Moreover, cable TV buys much more than only access to local TV. With cable TV, households receive 30 to 40 TV channels, mainly public and private channels from the neighboring countries, compared to only the handful of Swiss public stations with only terrestrial TV. It is therefore questionable if preferences for local TV would really drive cable subscriptions.

In sum, endogeneity seems not to be a big issue when looking at within-canton variation of local TV. Furthermore, it should be noted that the analysis is also based on the differentiation between different education groups and the distinction between cantonal and intercantonal TV stations. This again strengthens a causal interpretation of the results.

4.5.2. Results

This section presents the empirical analysis of the effect of local TV news on voters. First, the effects of local TV on television news consumption as well as on other media consumption are analyzed. Second, the effects local TV has on voter participation are investigated.

Table 19 presents the results on the effects of the presence of local TV on TV news consumption. Column (A) reveals that there is no statistically significant effect of the availability of local TV on respondents' TV news consumption when not differentiating between the different types of TV stations and between education groups. When looking at cantonal and intercantonal channels separately (column (B)) the coefficient for cantonal TV is positive and the coefficient for intercantonal TV negative but both effects are still not statistically significant at conventional levels. However, when interacting the availability of cantonal and intercantonal TV with individuals' education, cantonal TV has a statistically significant effect on TV news consumption (column (C)). People with low education watch more TV news when cantonal TV is available. As the interaction effect is statistically

[95] In the same period the number of households increased as well. The share of households having access to cable TV therefore only increased slightly. Detailed numbers on households are only available for the years 1990 (2.9 million households) and 2000 (3.2 million households).

significantly negative ($p \leq 0.05$), the marginal effect of TV becomes smaller the higher the education of the respondent. Interestingly, there is no statistically significant effect of intercantonal TV on news consumption, not even for people with low education. Only when local TV markets match well with jurisdictions do people use local TV as a regular information source. Including additional control variables at community level in column (D) does not change the general picture. The coefficients, however, become somewhat smaller in size and statistical significance. In column (E) the share of households having access to local TV is used instead of a dummy variable. Again, the general results stay the same.

Table 19: Local TV and TV News Consumption

Dependent variable: TV news consumption [0-7]	(A)	(B)	(C)	(D)	(E)
	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)
Local TV (any kind)	0.079				
	(0.58)				
Cantonal TV		0.151	0.570*	0.479(*)	0.580*
		(0.85)	(2.37)	(1.92)	(2.22)
Cantonal TV * education			-0.118*	-0.117*	-0.086(*)
			(-2.37)	(-2.35)	(-1.70)
Intercantonal TV		-0.147	0.097	0.148	0.101
		(-0.99)	(0.45)	(0.67)	(0.44)
Intercantonal TV * education			-0.076	-0.083	-0.065
			(-1.40)	(-1.51)	(-1.17)
Education	yes	yes	-0.099*	-0.098*	-0.128**
			(-2.13)	(-2.07)	(-2.82)
Socio-demographic controls	yes	yes	yes	yes	yes
Political interest and participation	yes	yes	yes	yes	yes
Community type and size	no	no	no	yes	yes
Canton-fixed effects	yes	yes	yes	yes	yes
No. of observations	4,225	4,225	4,190	4,190	4,162
R-squared	0.17	0.17	0.17	0.18	0.18

Notes: OLS regression with robust standard errors clustered at community level, t-values in brackets. The dependent variable is the number of days a week respondents watch TV news. In columns (A) to (D) local TV is a dummy variable taking the value 1 if a cantonal or intercantonal channel is distributed in a community. In column (E) local TV is measured as the share of households in a community having access to a cantonal or intercantonal channel. Socio-demographic controls include sex, age, household income, marital status, employment status, household size, and for how many years respondents have been living in the canton. A dummy variable for the top income category and dummy variables indicating missing observations for political interest, participation in last elections, household income, marital status, employment status, years living in canton and, in regression (A) and (B), education are included as well.

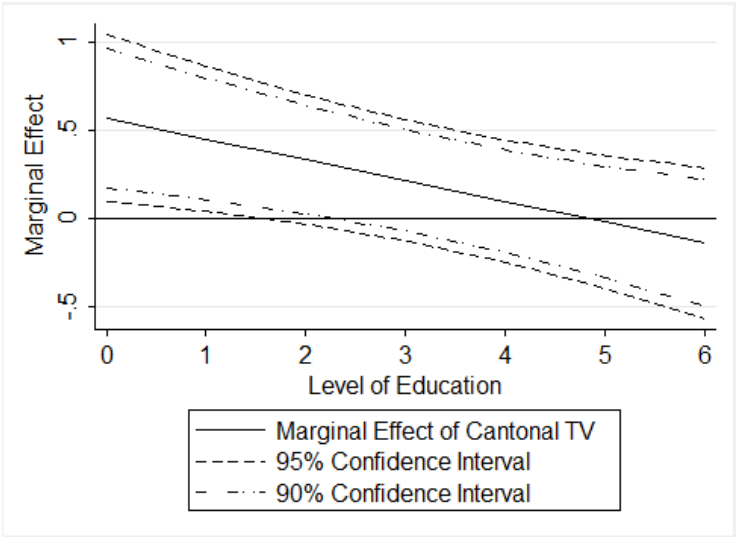
Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: Selects 2007 (Selb et al. 2008), Federal Statistical Office, and own compilation based on data from SuissImage.

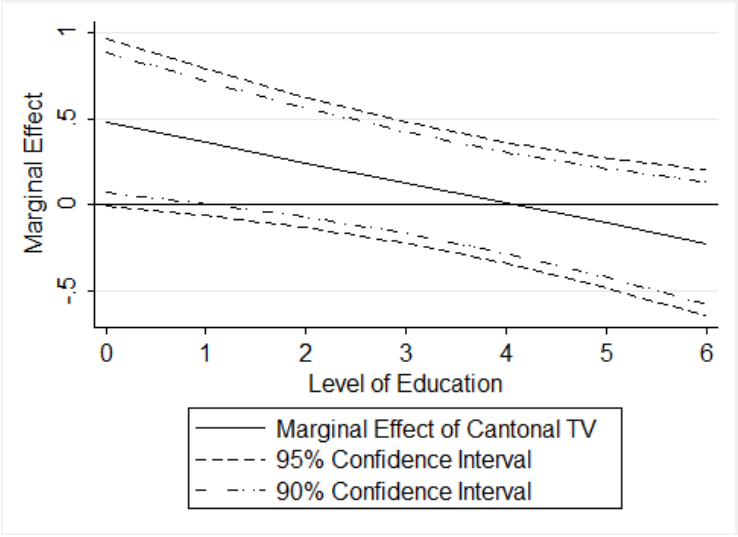
Figure 14 graphically shows the marginal effect of cantonal TV on TV news consumption for all seven education categories of regression (C) to (E) and for a specification including all educations categories and its interaction with local TV separately (results not shown in Table 19).[96]

Figure 14: Marginal Effect of Cantonal TV on TV News Consumption by Level of Education

a)

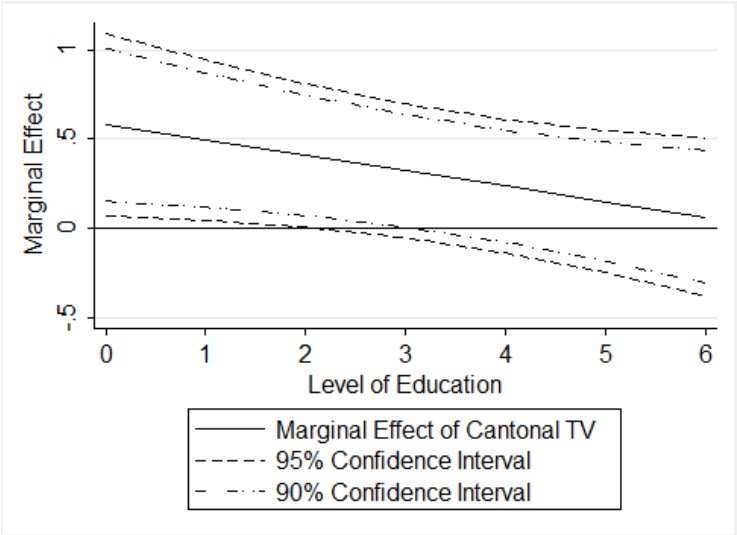


b)

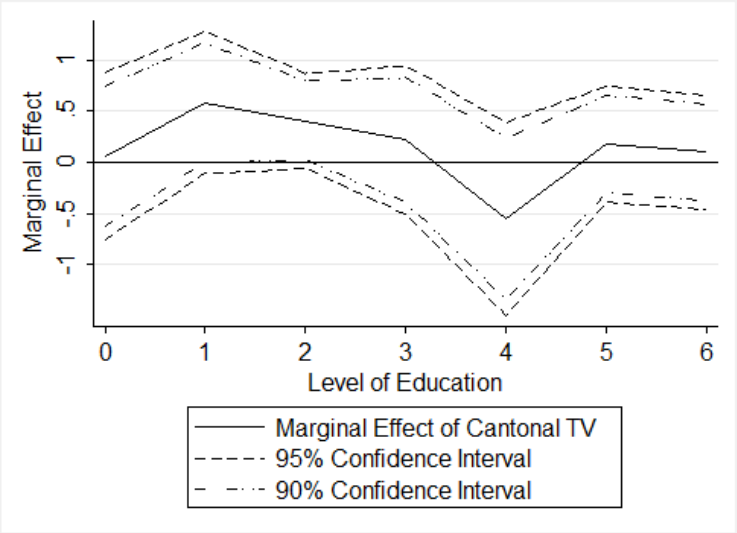


[96] See Brambor, Clark and Golder (2006) for a discussion on the interpretation and presentation of interaction models.

c)



d)



Notes: For specification and data sources of a) to c) see Table 12, regression (C) to (E). For d), education categories and their interaction with local TV have been included separately in the regression (regression results not shown in Table 12). The specification is otherwise equal to estimation (E) in Table 12.

Depending on the exact specification, the marginal effect is positive and significant for education categories one to two or three, i.e., for people having vocational education / higher secondary schooling or less, and then drops below statistical significance for people with higher education. The marginal effect is sizeable. People with only primary school education watch on average half a day more the news when there is cantonal TV. Looking at the more flexible specification in Figure c), it becomes evident that cantonal TV increases the news consumption of people with compulsory and vocational education but not of people with only primary school or less.

Table 20 presents the results on how people adjust their newspaper and radio consumption to the availability of local TV news.

Table 20: Local TV and Newspaper and Radio News Consumption

Dependent variable:	*Newspaper news [0-7]*		*Radio news [0-7]*	
	(A)	(B)	(C)	(D)
	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)
Cantonal TV	0.026	0.373	-0.138	-0.117
	(0.17)	(1.55)	(-0.67)	(-0.44)
Cantonal TV * education		-0.092		-0.001
		(-1.58)		(-0.01)
Intercantonal TV	0.046	0.232	0.040	0.121
	(0.31)	(1.01)	(0.21)	(0.42)
Intercantonal TV * education		-0.060		-0.025
		(-0.98)		(-0.36)
Education	yes	0.208**	yes	-0.016
		(4.22)		(-0.27)
Socio-demographic controls	yes	yes	yes	yes
Political interest and participation	yes	yes	yes	yes
Community type and size	yes	yes	yes	yes
Canton-fixed effects	yes	yes	yes	yes
No. of observations	4196	4161	4215	4180
R-squared	0.33	0.33	0.07	0.06

Notes: OLS regression with robust standard errors clustered at community level, t-values in brackets. The dependent variable is in columns (A) and (B) the number of days a week respondents read news in newspapers and in columns (C) and (D) the number of days a week respondents listen to the news on radio. Local TV is a dummy variable taking the value 1 if a cantonal or intercantonal channel is distributed in a community. Socio-demographic controls include sex, age, employment status, marital status, household income, household size, and for how many years respondents have been living in the canton. A dummy variable for the top income category and dummy variables indicating missing observations for political interest, participation in last elections, household income, marital status, employment status, years living in canton and, in regression (A) and (B), education are included as well. *Significance levels*: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: Selects 2007 (Selb et al. 2008), Federal Statistical Office, and own compilation based on data from SuissImage.

No statistically significant effects are found when distinguishing between cantonal and intercantonal TV or when interacting local TV with education. Therefore, there is no evidence that TV channels choose their diffusion area due to people's interest in local news, i.e., there is no evidence that local TV penetration is endogenous to news consumption. Furthermore, people seem not to substitute away from other news media when local TV is available. Rather they increase their total news consumption by consuming more TV news.

Now, the question arises if this increased news consumption due to local TV further affects behavior. Better information should decrease the probability of making a wrong voting

decision, increase consumption benefits of voting, stimulate interest in politics and increase political participation (Matsusaka 1995; Leeson 2008). Hence, I analyze whether the presence or absence of local TV affects participation in federal elections. As cantons correspond to electoral districts, it is hypothesized that cantonal TV news in particular positively affects turnout. I again distinguish between different levels of education. Table 21 presents the results of the probit regressions.

Table 21: Local TV and Voter Participation

Dependent variable: participation in federal elections	(A) Coef. (z-value)	(B) Coef. (z-value)	(C) Coef. (z-value)	(D) Coef. (z-value)	(E) Coef. (z-value)
Local TV (any kind)	0.063				
	(0.74)				
Cantonal TV		0.150	0.399**	0.437**	0.418**
		(1.36)	(2.64)	(2.85)	(2.60)
Cantonal TV * education			-0.082*	-0.085*	-0.071(*)
			(-2.47)	(-2.56)	(-1.94)
Intercantonal TV		0.012	0.088	0.090	-0.013
		(0.11)	(0.61)	(0.60)	(-0.08)
Intercantonal TV * education			-0.028	-0.035	0.004
			(0-0.74)	(-0.92)	(0.09)
Education	yes	yes	0.111**	0.116**	0.090**
			(3.54)	(3.67)	(2.76)
Socio-demographic controls	yes	yes	yes	yes	yes
Political interest and participation	yes	yes	yes	yes	yes
Community type and size	no	no	no	yes	yes
Canton-fixed effects	yes	yes	yes	yes	yes
No. of observations	4230	4230	4195	4195	4167
Pseudo R-squared	0.35	0.35	0.35	0.35	0.35

Notes: Probit regressions with robust standard errors clustered at community level, z-values in brackets. The dependent variable is the participation in federal elections (National Council). In columns (A) to (D) local TV is a dummy variable taking the value 1 if a cantonal or intercantonal channel is distributed in a community. In column (E) local TV is measured as the share of households in a community having access to a cantonal or intercantonal channel. Socio-demographic controls include sex, age, employment status, marital status, household income, household size, and for how many years respondents have been living in the canton. A dummy variable for the top income category and dummy variables indicating missing observations for political interest, participation in last elections, household income, marital status, employment status, years living in canton and, in regression (A) and (B), education are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: Selects 2007 (Selb et al. 2008), Federal Statistical Office, and own compilation based on data from SuissImage.

Columns (A) and (B) reveal that there is again no statistically significant effect of local TV on voter participation on average, neither when looking at local TV overall nor when distinguishing between cantonal and intercantonal television. Yet, when interacting the level of respondents' education with the availability of cantonal and intercantonal TV coefficients become statistically significant (column C). Cantonal TV increases the probability of participating in elections for people with low levels of education, and the effect becomes smaller for higher levels of education.[97] There is again no statistically significant effect of intercantonal TV on voting in federal elections. The coefficients remain stable when including controls at the community level (column D) and when using the share of households with access to local TV in a community instead of a dummy variable (column E).

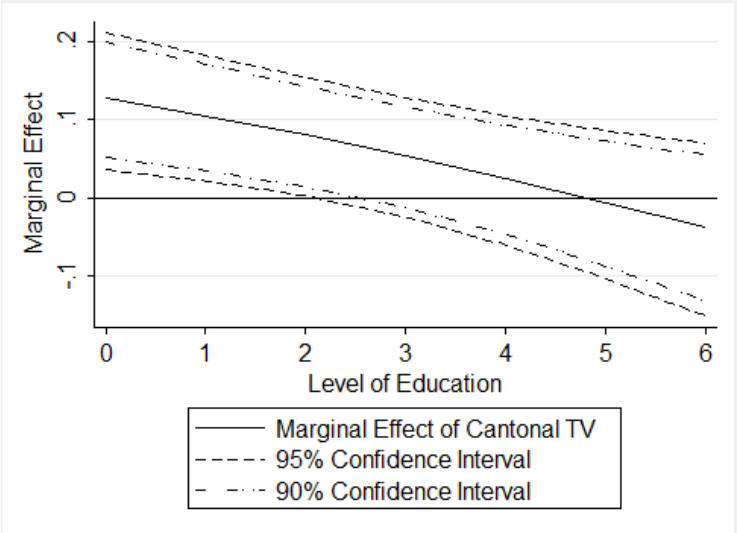
Figure 15 shows the marginal effects of cantonal TV on political participation for specifications (C) to (E).[98] Depending on the exact specification, cantonal TV increases the probability of voting participation for persons with only primary school (education category 0) by about 12 percentage points ($p \leq 0.01$). For people with secondary school or vocational education (education categories 2 and 3), the effect is with about 0.08 to 0.10 still sizeable and statistically significant at the 95% level. In education category 3 (higher secondary schooling), the effect has the size of about 0.05 and is in some specifications statistically significant at the 90% level. For respondents with higher education, the effect drops further and is not statistically significant at conventional levels anymore. Figure 15d) shows a more flexible specification where education categories and the interaction with cantonal and intercantonal TV have been added separately to the estimation. The general picture stays the same. There is a positive statistically significant effect of cantonal TV on voter participation for people in education categories 2 and 3 (vocational and higher secondary schooling) but not for people with lower or higher education.

[97] As is shown by Norton et al. (2004), marginal interaction effects in non-linear models can vary by the value of the other variables included in the model. Running the *inteff* command in Stata proposed by the authors reveals that the interaction effect is negative for virtually all observations and statistically significant for most observations (except for some of the observations with very low and very high predicted probabilities).

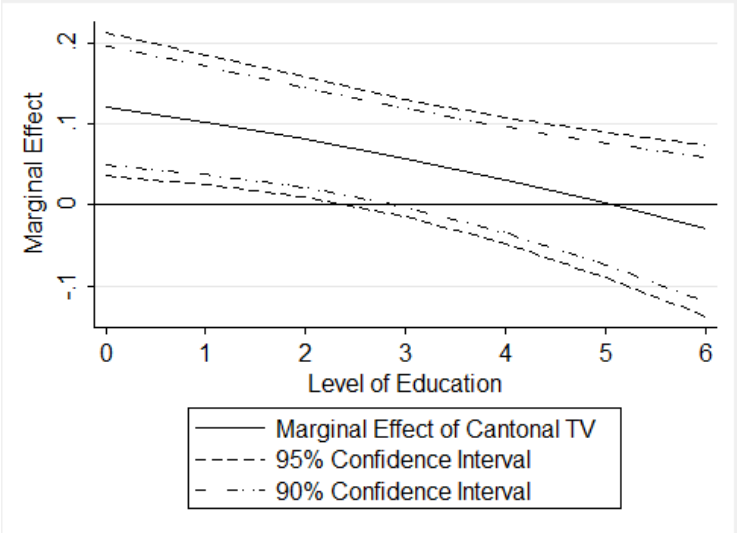
[98] Marginal effects are calculated as the difference between the predicted probability of voting with cantonal TV and the predicted probability of voting without cantonal TV for an average individual without intercantonal TV. Hence, continuous control variables are at their mean and for categorical control variable the most frequent category is chosen. See the descriptive statistics in Table 18. The methodology is based on Brambor et al. (2006; 2008).

Figure 15: Marginal Effect of Cantonal TV on Political Participation by Level of Education

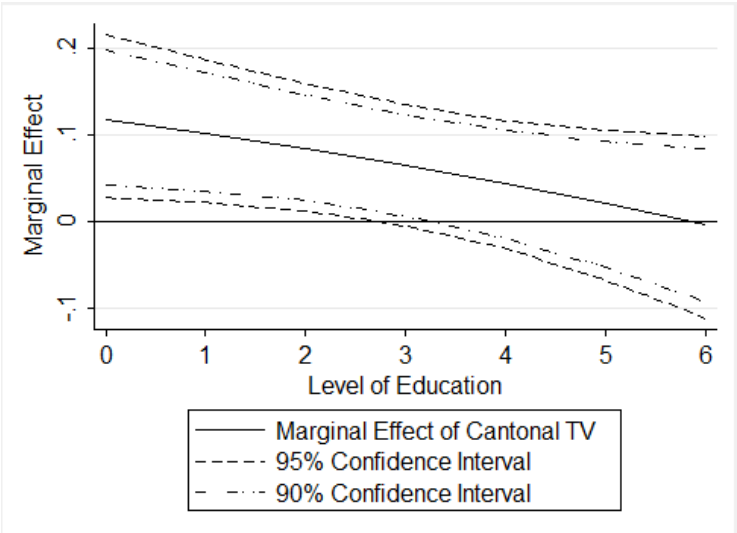
a)



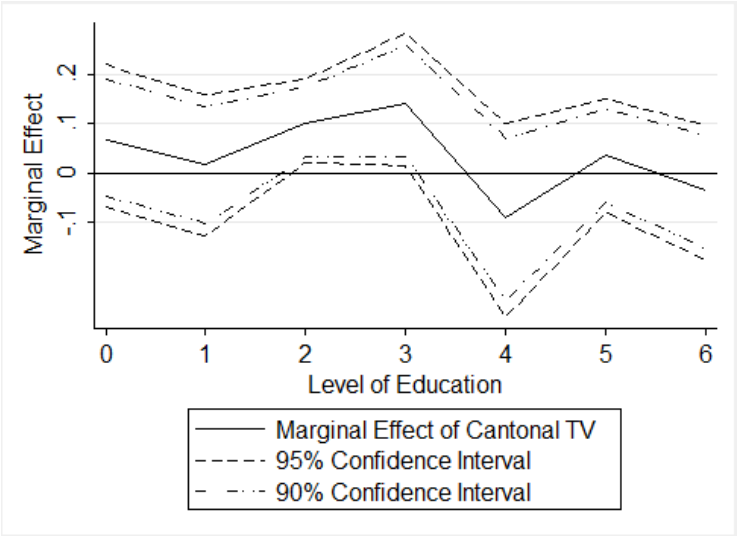
b)



c)



d)



Notes: For specification and data sources of a) to c) see Table 21, regression (C) to (E). For d), education categories and their interaction with local TV have been included separately in the regression (regression results not shown in table 6). The specification is otherwise equal to estimation (E) in Table 21.

In sum, the empirical analysis reveals that people with low and especially with intermediate education consume more news and participate more in elections when they have access to a local TV station with a distribution area that matches well with sub-national jurisdictions. There is no such effect for people with higher education and in areas where local TV channels span over several jurisdictions. The effects are robust to different measures of local TV penetration and to different empirical specifications.

4.6. Local TV and Election Campaigns

This chapter broadens the perspective taken so far and not only looks at the consumers but also at the (spillover) effects TV can generate on other actors. Not only voters but also politicians might react to the availability of different media and to different media market structures. The hypothesis that TV is more person-oriented than newspapers or radio and leads to changed incentives of politicians is examined by once again using data on Swiss federal elections. Federal elections take place every four years. Both chambers of parliament, the National Council consisting of 200 members (number of members are proportional to the population of the electoral districts), and the Council of States consisting of 46 members (two from each full canton and one from each of the six half cantons), are elected on the same day. Election campaigns of political parties therefore cover both elections simultaneously. Each of the 26 cantons forms an electoral district. Members of the National Council are elected by proportional representation and members of the Council of States by majority rule (except in the canton of Jura). Due to the different election rule and the much smaller number of candidates, Council of States candidates are much more present in the election campaigns.

Most members of the Council of States belong to one of the four big parties represented in the federal government.[99] In most cantons, members of small parties have a negligible chance of being elected. Usually, there are therefore only a few candidates competing for a seat in the Council of States. Yet, this seems to have changed during the last few years. In 2007, there were, for example, 12 official candidates for the two seats of the canton of Zurich compared to 7 candidates in 1991. Table 22 lists the average number of candidate in a canton for all election years since 1990, both in total and of small parties only. Small parties are defined as parties not represented in the federal government (independent candidates are not included). The total number of candidates increased from an average of 4.3 in 1991 to 5.3 in 2007 and the number of candidates from small parties from 1.0 to 1.4. However, the trend is not clearly linear.

[99] These parties are the SP, CVP, FDP, and SVP. Since 1959, the Swiss Federal Council, which has seven members, has only consisted of members of these four parties. The Council of States usually includes none or very few members from other parties. In the period 1991-2007 there were on average two Councils of States members from other parties

Table 22: Candidates for Council of States Elections 1991-2007

Average number of candidates in cantons	Year				
	1991	1995	1999	2003	2007
No. of candidates	4.3	4.4	4.9	4.6	5.3
No. of candidates of small parties	1.0	1.1	1.2	1.0	1.4

Data Source: Federal Statistical Office.

The *Neue Zürcher Zeitung* (2007) attributes this change to local TV and writes that some small parties openly admit that their candidates run only to increase the party's presence in the media. The above supposition is a nice example of how changes in the media environment change the behavior of politicians visibly, and it is empirically tested. In the following section the data and empirical strategy are presented in detail.

4.6.1. Data and Empirical Strategy

Politicians' reactions to the availability of local TV and the increased TV news consumption by voters are empirically investigated using the following specifications:

$$CSC_c = \beta_0 + \beta_1 TV_c + \gamma_1 ELEC_c + \gamma_2 X_c + \varepsilon_c$$

$$CSC_c = \beta_0 + \beta_1 CTV_c + \beta_2 ITV_c + \gamma_1 ELEC_c + \gamma_2 X_c + \varepsilon_c$$

The number of candidates for the council of states CSC_c in canton c depends on the presence of local television TV_c in canton c, as well as election specific control variables $ELEC_c$ and other control variables X_c at the cantonal level. In the second specification it is again differentiated between cantonal (CTV_c) and intercantonal (ITV_c) TV stations. As in the previous section, two different indicators for the presence of TV are used: a dummy variable indicating if a local TV station is present in a canton or not and a variable accounting for the share of households that is able to receive local TV in a canton. Data on the number and the parties of candidates for the Council of States are from the Swiss Federal Statistical Office. Control variables include the number of free seats, i.e., how many incumbents run for re-election, if any candidates are voted out, if candidates are elected at a citizens' assembly or not, and variables for number of inhabitants and size of cantons, as well as for the local

economic situation (unemployment rate). The data source is also the Swiss Federal Statistical Office. Ordinary least squares regressions are estimated.

These specifications, however, have to be interpreted with caution. Cantons with cantonal TV differ also in other respects from cantons with intercantonal or no local TV. They are usually bigger and more urban etc. Although I control for such aspects, an omitted variable bias could occur nevertheless as the analysis can be done at the cantonal level only and canton dummies cannot be included within the regression as can be done when looking at the effects on voters. The study is therefore supplemented with a panel data analysis for the years 1991 to 2007.

$$CSC_{cy} = \beta_0 + \beta_1 CTV_{cy} + \beta_2 ITV_{cy} + \gamma_1 ELEC_{cy} + \gamma_2 D_c + \gamma_3 D_y + \varepsilon_{cy}$$

$$CSC_{cy} = \beta_0 + \beta_1 CTV_{cy} + \beta_2 ITV_{cy} + \gamma_1 ELEC_{cy} + \gamma_2 D_c + \gamma_3 D_y + \gamma_3 TTREND_c + \varepsilon_{cy}$$

Ordinary least squares fixed-effects estimators are applied controlling for time-invariant canton specific effects (D_c). Year dummies (D_y) are included as well to control for time-fixed effects that affect all cantons equally. A further specification also includes canton-specific time trends.

4.6.2. Results

Table 23 shows the results for a cross-section over 25 cantons for the year 2007.[100] Column (A) shows that the average number of candidates from small parties with a negligible chance of being elected into the Council of States is higher when local TV is available in a canton. The effect is sizeable (1.6) and statistically significant at the 90% level. Column (B) takes a closer look at the effects of local TV and differentiates between TV stations covering only one canton and TV stations covering several cantons. The effects should be more pronounced for cantonal TV channels as candidates in these cantons get more attention from local TV. The empirical results support this hypothesis. It is revealed that only cantonal TV is statistically significantly associated with the number of candidates from small parties. The coefficient is considerable in size (2.8, $p \leq 0.01$). The effect is robust when using the share of households having access to local TV in a canton instead of a dummy variable (column (C)).

[100] The canton of Jura is excluded from the analysis because it is the only canton with proportional representation.

Column (D) reveals that the coefficient is also statistically significant when looking at the total number of candidates.

Table 23: Local TV and the Number of Candidates for State Council Elections 2007

	(A)	(B)	(C)	(D)
	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)
Local TV (any kind)	1.616(*) (1.72)			
Cantonal TV		2.814** (3.02)	3.070** (2.90)	4.565* (2.37)
Intercantonal TV		0.914 (1.07)	1.067 (1.00)	0.390 (0.22)
Non-incumbent seats	-0.440 (-0.91)	-0.489 (-1.17)	-0.527 (-1.22)	-0.521 (0.60)
Citizens' assembly	0.240 (0.18)	0.021 (0.02)	0.323 (0.28)	-1.552 (-0.66)
Number of inhabitants (1000)	(0.004)** (3.81)	0.003** (3.20)	0.003** (3.11)	0.003 (1.67)
Size of canton	-0.000 (-0.14)	-0.000 (-0.73)	-0.000 (-0.53)	0.000 (0.17)
Unemployment rate	0.548* (2.21)	0.148 (0.56)	0.220 (0.87)	0.277 (0.51)
No. of observations	25	25	25	25
R-squared	0.67	0.76	0.76	0.72

Notes: OLS regressions, t-values in brackets. The dependent variable in columns (A) to (C) is the number of Council of States candidates from small parties not represented in the Federal Council (without independent candidates) and in column (D) the number of all Council of States candidates. Local TV is in columns (A), (B) and (D) a dummy variable indicating if cantonal or intercantonal TV is available in a canton and in column (C) the share of households in a canton receiving cantonal or intercantonal TV.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: Federal statistical office and own compilation based on information from BAKOM, TV stations, and several newspaper archives.

The results stay robust using panel data for the period 1990-2007, although the coefficients become somewhat smaller. Table 24 presents the results.

Table 24: Local TV and the Number of Candidates for State Council Elections 1991-2007

	(A)	(B)	(C)	(D)
	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)	Coef. (t-value)
Local TV (any kind)	0.539(*) (1.84)			
Cantonal TV		1.256** (3.73)	0.871(*) (1.97)	0.830 (1.30)
Intercantonal TV		0.079 (0.26)	-0.095 (-0.24)	-0.782 (-1.37)
Free seats	0.300* (2.42)	0.270* (2.32)	0.153 (1.22)	0.951** (4.33)
Vote-out	-0.225 (-0.37)	-0.152 (-0.53)	-0.480 (-1.43)	-0.300 (-0.55)
Citizens' assembly	0.009 (0.02)	-0.363 (-0.70)	-0.333 (-0.35)	-0.294 (-0.30)
Year dummies	Yes	Yes	Yes	Yes
Canton-specific time-trends	No	No	Yes	No
No. of observations	125	125	125	125
No. of groups	25	25	25	25
Observations per group	5	5	5	5
R-squared (within)	0.11	0.23	0.47	0.28

Notes: Canton-fixed effects regressions (OLS), t-value in brackets. The dependent variable in columns (A) to (C) is the number of Council of States candidates from small parties not represented in the Federal Council (without independent candidates) and in column (D) the number of all Council of States candidates.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Sources: Federal statistical office and own compilation based on information from BAKOM, TV stations, and several newspaper archives.

Column (A) in Table 24 shows that the introduction of local television leads on average to an increase of the number of candidates by 0.5 ($p \leq 0.1$). Column (B) reveals that the effect is due to cantonal TV only. When cantonal TV becomes available, the number of candidates from small parties increases by more than one. The coefficient is highly significant ($p \leq 0.01$). In contrast, the introduction of intercantonal TV does not affect the number of candidates at all. The effect stays robust when including canton-specific time trends into the analysis (column (C)). No corresponding effects are found when looking at the total number of candidates (column (D). In sum, running for the Council of States seems to increasingly serve promotional purposes when local TV comes into play.

4.7. Concluding Remarks

Different types of media differ not only in their technology but also in the way they present information. Different target groups are addressed and catered to by different styles and content. Due to the dominance of the picture, TV news focus much more on persons than on facts as compared with newspapers and radio, and TV news present political information in a simpler manner. This chapter shows that TV consumption therefore has an important and systematic impact on the behavior of voters. The supposedly exogenous variation of local TV in Switzerland at the community level is used as an empirical tool to identify causal effects. In particular, voters with low education react to the presence of local TV by increasing their news consumption and their participation in elections. Furthermore, politicians and parties adjust to TV being person-oriented by increasingly focusing their election campaigns on individual politicians instead of party programs. They nominate candidates for the sole purpose of being present on TV even if they have no actual chance of winning the election. All effects are much more pronounced when TV markets match well with sub-national jurisdictions. The presence of these differentiated effects lends support to a causal interpretation of the effects of local TV on behavior.

Now, the question arises if and how these behavioral changes further affect the political process and political outcomes. Not all voter and interest groups will profit in the same way from a changing media environment. TV mainly affects people with low education. Will television also benefit them in the sense that they will be better able to enforce their preferences in the political process? Further research should also address the effects of television consumption on political outcomes, like taxes and government spending.

Second, the findings may have repercussions for the regulation of local TV markets. In Switzerland, a new radio and television law (RTVG) was enacted in 2007. While local TV stations do, in general, no longer require a license,[101] a few licensed channels get public subsidies. However, only one station per pre-defined territory gets such a subsidy. These pre-defined territories usually span over several cantons. The research presented here shows that TV stations covering only one canton produce particular meaningful information that is consumed by voters and leads them to increase their political participation. If local TV is to be subsidized efficiently, more attention should be paid to the match between TV markets and sub-national jurisdictions.

[101] However, all TV stations must register with the *BAKOM*.

5. Conclusions

This thesis presents an economic analysis of television consumption that goes beyond standard rational choice theory. Specifically, the thesis empirically studies the determinants of TV watching and its effects on subjective well-being and political participation. The results reveal beneficial as well as unfavorable impacts of TV consumption. Some individuals are induced by television's immediate gratification at low immediate marginal costs to spend more time consuming it than they actually would prefer, and their utility is thus reduced. On the other hand, television consumption serves an important informational need, especially for people not attracted by more cognitively demanding media, such as newspapers. When local TV is available, people with low and intermediate education consume more news and increase participation in elections. The importance of television is furthermore established by looking at its effects on election campaigns: politicians react to the presence of television and more candidates run for Council of States elections in Switzerland when local TV is available. Hence, the different empirical applications that highlight very different aspects of the broad phenomena "television consumption" all point in the same direction: TV is relevant for individual behavior and well-being.

The studies presented, as well as the media literature in general, face several challenges that are discussed in the following sections. While specific issues are considered in the respective chapters, I discuss critical issues and open questions, as well as implications for research and policy, on a more general level here.

Causality issues

All empirical applications deal with the problem of identifying causal effects on and of television consumption. Do unhappy people watch more TV than happy people, or does watching TV make people unhappy? Does some empirical relationship between TV consumption and political participation reflect that people with different preferences and different interests select different amounts and different sources of news? Or does TV have a causal impact on people's political activities? Economists' usually apply very stringent methodologies and have very high standards regarding data in order to properly identify one-directional causal effects and to rule out alternative explanations. In the area of media research, this contrasts, at least to some extent, with research by scholars from other social sciences who are much less interested in causality or who make causal inferences based on lower methodological standards.

While the high standards of economists' clearly represent a big advantage, especially if one would like to infer policy conclusions from empirical results, they also come at a cost. The standards render it difficult for a researcher to empirically analyze a relevant problem or an interesting research question if data availability and quality do not meet these standards. This thesis attempts to analyze interesting questions in a relevant field where the available data do not meet the highest standards but avoid naive conclusions drawn from basic empirical relationships.

Ideally, one would prefer some kind of regionally differing exogenous variation of TV supply over time in connection with an individual level panel data set that includes the variables of interest as well as important control variables. Due to the lack of such a perfect setting, most empirical applications in this dissertation are based on cross-sectional data only. However, several differentiated hypotheses are tested in order to obtain a broad and detailed picture of the empirical relationship between TV consumption and the outcome variables, in this case primarily life satisfaction and political participation. In robustness analyses, I check the results with different specifications and try to rule out (some) alternative explanations. While all the results are consistent with the hypotheses, such an approach cannot exclude all alternative explanations, specifically, that a third uncontrolled factor drives the dependent as well as the independent variables. It could theoretically be possible that unhappy people with high materialistic values, with high opportunity costs of time or in countries with many TV channels resort to TV watching, while unhappy people with low materialistic values, with low opportunity costs of time or in countries with only a few TV channels do not. People with low education from communities with high cable penetration in cantons with cantonal TV (mostly urban cantons) could be different from people with low education from communities with high cable penetration in cantons with intercantonal TV (mostly rural cantons). Hence, the statistical relationship between local TV availability, TV consumption, political participation and education could be spurious. While it is rather difficult to conjecture such a story, results should nevertheless be interpreted with care, and especially, policy implications should be advocated cautiously. The latter point is also important because the exact causes of the observed statistical relationships or the mechanisms leading to them (even if they are causal) are no entirely clear.

Explanation of results

While the empirical results are consistent with the hypotheses established in the different parts of the thesis, the exact mechanisms underlying the empirical results have not been studied in detail. Because this issue is somewhat specific to the respective hypothesis, I discuss the problem separately for the two main empirical applications.

In chapter 3, self-control problems and utility misprediction have been put forward as explanations for the negative effect of watching TV on life satisfaction and several additional hypotheses have been tested that are consistent with and support this interpretation. Nevertheless, some questions remain. First, the two explanations – self-control problems and utility misprediction – cannot be separated. The gravity of each explanation's importance is unclear, i.e., how much each explanation accounts for the negative relationship between TV consumption and subjective well-being. While some of the costs of watching TV have been identified as changed preferences and beliefs, and the empirical results show that they account for about half of the effect of TV viewing on life satisfaction, it is unclear why some people do not give such costs their sufficient due. Is it because such persons do not foresee the costs completely (or even not at all); or do they allot too much discount to such costs during the moment of decision making? Furthermore, it might well be possible that the two mechanisms are not independent and reinforce each other.

It must also be noted that the specific preferences and beliefs studied in the empirical analysis naturally do not represent all possible channels through which TV watching might affect subjective well-being. The analyzed channels address some of the issues most prominently discussed in the media effects literature, but nevertheless they are just examples of possible effects. Hence, more research, especially more psychological foundation, would be needed in order to really comprehend and explain in detail the underlying causes and effects of TV watching that lead to lower life satisfaction. It would be especially interesting to understand why people do not seem to learn from their previous mistakes and change their behavior correspondingly, but rather seem instead to continually repeat the same mistakes. Such an understanding is especially important for policy conclusions, i.e., for advice on how to help people overcome their lack of willpower. This last point is also discussed below.

In chapter 4, the reasons why local TV news leads some people to increase participation in elections have been even less explicitly examined. Several explanations are possible. First, people may learn from the media. Better knowledge enables them to make a better voting

decision, i.e., leads to a higher probability of actually choosing their preferred candidate. Therefore, the benefits of voting become higher, thus leading to an increased participation in the elections. The marginal effect of TV on political knowledge is especially high for people with ex ante little knowledge who are not targeted by other, cognitively more demanding media. In principle, this channel could be empirically tested. One might study, for example, whether people with local TV access are more aware, on average, of certain political issues or candidates. However, the type of knowledge needed by voters to make a reasonable decision is not quite clear. Voters may not require factual knowledge that can be captured in surveys (e.g. regarding a candidate's or a party's stand on certain political issues). Simple cues regarding ideology or personality of candidates can be sufficient for some voters. Hence, it is not surprising that literature concerning the effects of media consumption on political knowledge show very limited results, which has led some researchers to the (questionable) conclusion that the news media do not fulfill their function very well (see Norris 2000 for a comprehensive and critical discussion).

Second, it is possible that voters respond to mobilization efforts conveyed through TV. Again, this effect is supposedly strongest for the less educated who are subject to a lower ex ante participation rate. Third, regularly watching TV news can increase political awareness and interest and stimulate political discourse leading to a “virtuous circle”, where again media and information consumption is strengthened (see, again, Norris 2000). In this respect, the importance of a shared media platform, especially with regard to the effects on political discourse, is an interesting and relevant topic. When people all watch the same evening news, they have shared knowledge and focal points for discussion. If, on the other hand, selection and filtering of information according to ones interests and political attitudes is very easy, then political discourse may be impeded. This can be the “dark side” of media diversity and filtering options provided by, for example, the internet (see Sunstein 2007 and, for a similar argument, Prior 2005).

Furthermore, local TV can also stimulate local identification of individuals and lead to higher local political participation. In this respect, and also on a more general level, the role of language in television reporting (e.g. whether presentation of local television news in the local dialect has any relevance) might also make for an interesting study.

Another possible explanation for the empirical results is that the more personalized coverage of TV as compared to other media leads to a shift from policy issues to issues regarding politicians, i.e., more weight is placed on elections rather than on referendums and initiatives.

If one wants to reach policy conclusions, then one must examine whether such an effect is beneficial or rather detrimental for the functioning of direct democracy in Switzerland.

Survey data

A further source of concern is that all empirical applications are based on survey data. Many economists do not trust survey data because subjective experiences are not publicly observable and because survey data can therefore be biased in different ways (see, e.g., Bertrand and Mullainathan 2001). However, such concerns and evaluation of potential biases must also reflect the intended use of the data. The quality of TV consumption measures is already discussed in chapter 2.3. Life satisfaction is shown to constitute a sufficiently valid and reliable proxy measure for experienced utility (see, e.g., Frey and Stutzer 2002b; Luechinger 2007). Nevertheless, some additional problems can stem from the fact that in some of the applications both dependent and independent variables originate from surveys. If some respondents similarly bias all their answers, for example due to some sort of social desirability, then the empirical results could systematically be biased. For example, some respondents might underreport their TV consumption because they feel that TV watching carries a stigma, while at the same time they overreport their life satisfaction because a high level of one's happiness might be viewed as desirable. Although I have no evidence of such reporting behavior, these and other similar potential biases must be acknowledged. Other biases, for example due to strategic answering behavior, are rather unlikely because the surveys used cover many different topics and issues, and dependent and independent variables are only connected ex post by the researcher.

Implications for economics

Keeping the discussed open questions in mind, the research presented in this dissertation leads to some implications for economics. Two major points are highlighted here: the integration of the media into economic theory and the acceptance of measures of experienced utility.

Even though imperfect information, information asymmetries and related problems have been taken seriously within economic theory since the 60s and 70s, the media have not yet been integrated, neither in standard market analyses nor in political economy or public choice theory. This neglect stands in large contrast to other social sciences and public opinion where the media are assumed to take an important role. While the decisiveness that this role plays is open to debate, many recent studies do convincingly show that the media matter for economic

as well as political markets. A systematic and serious integration of information provision of the media into economic theory seems therefore to be warranted and may lead to a better understanding of individual behavior in many areas of economic research.

The field of economic happiness research has been growing in recent years. However, many economists still seem to be skeptical towards measures of experienced utility or subjective well-being. While some skepticism is warranted, it somehow stands in contrast to the (often) uncritical acceptance of the assumption underlying the revealed behavior approach. Systematic evidence in the field of economics and psychology shows that these assumptions are questionable under certain circumstances. Chapter 3 of this thesis adds another relevant case to this literature. Imperfect self-control and imperfect prediction of future costs lead people to watch more TV than which they consider optimal based on their own self-evaluations. Limiting focus to revealed behavior or, in other words, to decision utility, leads, at least in this case, to an incomplete understanding of individuals' behavior. Hence, measures of experienced utility, such as life satisfaction, complement the picture in important ways. Taking such measures seriously and recognizing their potential as well as their limits seems more fruitful than an unqualified rejection.

Implications for media research

Furthermore, social sciences media research can also profit from the insights of economists within this research field, such as the empirical results presented in this thesis. The main points are methodological: selection should be taken seriously and trying to identify causal relationship is important if one wants to reach conclusions for media policy. The research presented here and research by other economists (and some other social scientists) confirms the empirical findings of traditional media researchers but also leads to very different conclusions. While consumers of less demanding and less information rich media such as television are less informed and participate less in politics, television cannot be held responsible for this lack of participation. On the contrary, without TV, such voters would be even less informed. Hence, merely drawing conclusions and even imparting policy advice on the basis of simple empirical relationships is probably too simplistic in this area of research.

Implications for policy

Implications for policy are faced with the problem of the very diverse aspects of television. Broadly speaking, the thesis presents beneficial as well harmful effects of TV consumption.

Nevertheless, regulatory interventions in media markets, and especially TV markets, represent the rule rather than the exception. While such interventions can historically be ascribed to technical reasons, i.e., to limited transmission frequencies, such a justification no longer holds in the digital age. Hence political and economic reasons have replaced, to some extent, the technical ones. Public good aspects and positive externalities of information consumption with respect to the function of democracy may lead to lower information provisions than is efficient (Sunstein 2007). Furthermore, both two-sided markets and the lack of a marginal price payment by consumers lead to preference intensities not reflected within the market as well as to an underprovision of minority content (Sunstein 2000).

Some justifications for regulatory intervention in the TV market also have a paternalistic element. Information provided by the media, in particular political information, is seen as a merit good (especially in the European context). The notion of a merit good rests on some normative assessment of what is seen as beneficial for consumers and society beyond consumer sovereignty (see, in general, Musgrave 2008; and, with regard to the media, Kiefer 2003). Irrational overconsumption due to self-control problems can also be put into this context, and this aspect of television may be viewed as a demerit good. With regard to such decision anomalies, libertarian paternalism has been suggested as a solution (see, e.g., Camerer et al. 2003; Thaler and Sunstein 2003; Glaeser 2006). Such government intervention is paternalistic in the sense that the aim is to promote better individual decision making but is also libertarian in the sense that consumer sovereignty and freedom of choice is observed. Defaults regarding retirement savings plans represent the most prominent example of such intervention (see, e.g., Choi et al. 2003). In order to stimulate saving, employees should, by default, participate in a company retirement savings plan but also maintain the right to resign from the plan at no penalty. With regard to TV consumption, it is difficult to think of such a libertarian intervention beyond that of information provisions concerning the beneficial and harmful effects of TV consumption.

In any case, it can be concluded from the presented research that if intervention in TV markets or media markets seems warranted, for example if local TV stations are to be subsidized as has recently been decided in Switzerland, more attention should be paid to market structures, and especially to the overlap between media and political markets. Other concrete policy advice is difficult due to the diverse impact of TV consumption and because the mechanisms that might explain the empirical results have not been investigated in detail.

Prospects for future research

The research presented in this thesis answers some questions but also leaves many others unaddressed. Parallel to the two empirical applications in chapter 3 and 4 of the thesis, two main avenues for further research are proposed here.

As discussed above, gaining insight into the exact mechanisms capable of explaining the empirical results would be compelling and relevant. An investigation into the individual's inability to learn and develop strategies for overcoming lack of willpower as regards television would be of great interest.[102] In this respect, further exploration of the role of technology would also be meaningful. For example, the presented evidence indicates that the number of TV channels are relevant for self-control problems. The introduction of technologies such as digital TV further increases the offerings. However, other changes also occur at the same time as a result of these new technologies. Two aspects are of special relevance. First, any program may be viewed on demand at any time. Second, pay-per-view schemes become increasingly available for film and television series. The first aspect, independence from a specific time slot, may lead to a reduction in both the opportunity costs of time and the severity of self-control problems but might also lead to an increase in temptation based upon constant availability of interesting TV offerings, as opposed to availability that is limited to prime time hours. The second aspect, pay-per-view television, increases immediate marginal cost and can lead to a reduction of self-control problems.

Regarding the role of the media in the political process, the mixture of both news and entertainment, i.e. "soft news", is a source of concern. The crowding out of hard news might lead to both less political knowledge and political cynicism. However, this verdict seems ambiguous when referring to political economic theories of rational ignorance that emphasize the lack of individual voter benefit derived from political information. Downs (1957a) already recognized that voters might learn about politics “by accident” through entertainment consumption. In other words, soft news decreases the information costs of citizens (see, e.g., Baum 2002; and, for a critique, Prior 2003). Furthermore, as information is considered to be an experience good whose value consumers only recognize after they have acquired it, soft news consumption might stimulate interest in a certain issue and boost the acquisition of

[102] For general discussions of this issue and on how (market) incentives may (and may not) transform decision anomalies and support learning see, e.g., Eichenberger (1992); Frey and Eichenberger (1994); List (2003); Slembeck and Tyran (2004).

related hard news (see, e.g., Baum 2005; Young and Tisinger 2006). Hence, understanding the role and effects of soft news seems relevant, also when considering the current distress of many "hard" newspapers and the rise of the internet and free newspapers with less dense informational content and more soft news.

On a more general level, the economic analysis of television consumption undertaken in this thesis attempts to show that the analysis of people's time use is at least as worthwhile as the analysis of their use of money, the traditional focus of economic applications. Time can even be considered the ultimate scarce resource. Hopefully, the reader has been convinced that an attempt at understanding the causes and consequences of people's allocation of this scarce resource to TV consumption is interesting and relevant.

References

Abraham, Katharine G., Sara E. Helms and Stanley Presser (2008). How Social Processes Distort Measurement: The Impact of Survey Nonresponse on Estimates of Volunteer Work. NBER Working Papers No. 14076, Cambridge, MA: National Bureau of Economic Research.

Abraham, Katharine G., Aaron Maitland and Suzanne M. Bianchi (2006). Nonresponse in the American Time Use Survey. *Public Opinion Quarterly* 70(5): 676-703.

Adams, William Jenson (1994). Changes in Ratings Patterns for Prime Time Before, During, and After the Introduction of the People Meter. *The Journal of Media Economics* 7(2): 15-28.

Aguiar, Mark and Erik Hurst (2005). Consumption Versus Expenditure. *Journal of Political Economy* 113(5): 919-948.

Ainslie, George (1975). Specious Reward - Behavioral Theory of Impulsiveness and Impulse Control. *Psychological Bulletin* 82(4): 463-496.

Akerlof, George A. (1970). Market for Lemons - Quality Uncertainty and Market Mechanism. *Quarterly Journal of Economics* 84(3): 488-500.

Albarran, Alan B. (2002). *Media Economics. Understanding Markets, Industries and Concepts*. Ames, IA: Iowa State Press.

Albarran, Alan B. (2004). Media Economics. In: John D.H. Downing, Denis McQuail, Philip Schlesinger and Ellen Wartella (eds). *The Sage Handbook of Media Studies*. Thousand Oaks: Sage: 291-307.

Alexander, Alison (2004). *Media Economics. Theory and Practice*. Mahwah, NJ: Lawrence Erlbaum Associates.

Allen, Charles L. (1965). Photographing the TV Audience. *Journal of Advertising Research* 5(1): 2-8.

Ameriks, John, Andrew Caplin, John Leahy and Tom Tyler (2007). Measuring Self-Control Problems. *American Economic Review* 97(3): 966-972.

Anderson, Simon P. and Stephen Coate (2005). Market Provision of Broadcasting: A Welfare Analysis. *Review of Economic Studies* 72(4): 947-972.

Anderson, Simon P. and André de Palma (2008). Competition for Attention in the Information (Overload) Age. Working Paper, Department of Economics, University of Virginia.

Anderson, Simon P. and Jean J. Grabszewicz (2006). The Media and Advertising: A Tale of Two-Sided Markets. In: Victor A. Ginsburgh (ed.). *Handbook of the Economics of Art and Culture*. Amsterdam: Elsevier: 567-614.

Angeletos, George-Marios (2001). The Hyberbolic Consumption Model: Calibration, Simulation, and Empirical Evaluation. *Journal of Economic Perspectives* 15(3): 47-68.

Ansolabehere, Stephen, Roy Behr and Shanto Iyengar (1991). Mass Media and Elections. *American Politics Research* 19(1): 109-139.

Ariely, Dan and Klaus Wertenbroch (2002). Procrastination, Deadlines, and Performance: Self-Control by Precommitment. *Psychological Science* 13(3): 219-224.

Arrow, Kenneth J. (1963). Uncertainty and the Welfare Economics of Medical-Care. *American Economic Review* 53(5): 941-973.

Arrow, Kenneth J. (1968). The Economics of Moral Hazard: Further Comment. *American Economic Review* 58(3): 537-539.

Arrow, Kenneth J. and Gerard Debreu (1954). Existence of an Equilibrium for a Competitive Economy. *Econometrica* 22(3): 265-290.

Baron, David P. (2006). Persistent Media Bias. *Journal of Public Economics* 90(1-2): 1-36.

Baron, Reuben M. and David A. Kenny (1986). The Moderator-Mediator Variable Distinction in Social Psychological-Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology* 51(6): 1173-1182.

Baum, Matthew A. (2002). Sex, Lies, and War: How Soft News Brings Foreign Policy to the Inattentive Public. *American Political Science Review* 96(1): 91-109.

Baum, Matthew A. (2005). *Soft News Goes Towar:Public Opinion and American Foreign Policy in the New Media Age*. Princeton, NJ: Princeton University Press.

Baumeister, Roy F., Matthew T. Gailliot, C. Nathan DeWall and Megan Oaten (2006). Self-Regulation and Personality: How Interventions Increase Regulatory Success, and How Depletion Moderates the Effects of Traits on Behavior. *Journal of Personality* 74(6): 1773-1801.

Baumeister, Roy F. and Todd F. Heatherton (1996). Self-Regulation Failure: An Overview. *Psychological Inquiry* 7(1): 1-15.

Baumeister, Roy F., Todd F. Heatherton and Dianne M. Tice (1994). *Losing Control: How and Why People Fail at Self-Regulation*. San Diego, CA: Academic Press.

Baumeister, Roy F., Brandon J. Schmeichel and Kathleen D. Vohs (2007a). Self-Regulation and the Executive Function: The Self as Controlling Agent. In: Arie W. Kruglanski and E. Tory Higgins (ed.). *Social Psychology. Handbook of Basic Principles*. New York and London: Guilford Press: 516-539.

Baumeister, Roy F., Kathleen D. Vohs and Dianne M. Tice (2007b). The Strength Model of Self-Control. *Current Directions in Psychological Science* 16(6): 351-355.

Bean, Clive and Antony Mughan (1989). Leadership Effects in Parlamentary Elections in Australia and Britain. *The American Political Science Review* 83(4): 1165-1179.

Bechtel, Robert B., Clark Achelpohl and Roger Akers (1972). Correlates between Observed Behavior and Questionnaire Responses on Television Viewing. In: Eli A. Rubinstein, George A. Comstock and John P. Murray (eds). *Television and Social Behavior, Reports and Papers: Vol. 4. Television in Day to Day Life: Patterns of Use*. Washington, DC: Government Printing Office: 274-344.

Becker, Gary S. (1965). A Theory of the Allocation of Time. *Economic Journal* 75(299): 493-517.

Becker, Gary S. (1976). *The Economic Approach to Human Behavior*. Chicago and London: University of Chicago Press.

Becker, Gary S. and Kevin M. Murphy (1988). A Theory of Rational Addiction. *Journal of Political Economy* 96(4): 675-700.

Becker, Lee B. and Klaus Schoenbach (eds) (1989). *Audience Responses to Media Diversification: Coping with Plenty*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Becker, Lee B., Tudor Vlad and Nancy Nusser (2007). An Evaluation of Press Freedom Indicators. *International Communication Gazette* 69(1): 5-28.

Benz, Matthias and Alois Stutzer (2004). Are Voters Better Informed When They Have a Larger Say in Politics? Evidence for the European Union and Switzerland. *Public Choice* 119(1-2): 31-59.

Bermejo, Fernando (2007). *The Internet Audience: Constitution & Measurement*. New York: Lang.

Bernheim, B. Douglas and Antonio Rangel (2005). Behavioral Public Economics: How to Do Welfare Analysis When People Can Make Mistakes. In: Peter A. Diamond and Hannu Vartiainen (eds). *Economic Institutions and Behavioral Economics*. Princeton: Princeton University Press.

Berry, Steven T. and Joel Waldfogel (2001). Do Mergers Increase Product Variety? Evidence from Radio Broadcasting. *Quarterly Journal of Economics* 116(3): 1009-1025.

Berry, Steven T. and Joel Waldfogel (2003). Product Quality and Market Size. NBER Working Paper No. 9675, Cambridge, MA: National Bureau of Economic Research.

Bertrand, Marianne and Sendhil Mullainathan (2001). Do People Mean What They Say? Implications for Subjective Survey Data. *American Economic Review. Papers and Proceedings* 91(2): 67-72.

Besley, Timothy and Robin Burgess (2002). The Political Economy of Government Responsiveness: Theory and Evidence from India. *Quarterly Journal of Economics* 117(4): 1415-1451.

Besley, Timothy and Andrea Prat (2006). Handcuffs for the Grabbing Hand? Media Capture and Government Accountability. *American Economic Review* 96(3): 720-736.

Betzel, Marcel (2003). Programme Performance of Public Service Broadcasting and Its Mission in the Digital Age. Paper prepared for the 17th EPRA meeting in Naples, Italy, 8-9 May 2003.

Blumler, Jay G. and Dennis Kavanagh (1999). The Third Age of Political Communication: Influences and Features. *Political Communication* 16(3): 209-230.

Bowden, Sue and Avner Offer (1994). Household Appliances and the Use of Time: The United States and Britain since the 1920s. *Economic History Review* 47(4): 725-748.

Brambor, Thomas, William Roberts Clark and Matt Golder (2006). Understanding Interaction Models: Improving Empirical Analyses. *Political Analysis* 14(1): 63-82.

Brambor, Thomas, William Roberts Clark and Matt Golder (2008). Multiplicative Interaction Models. Available online at http://homepages.nyu.edu/~mrg217/interaction.html (accessed on October 03, 2008).

Brunetti, Aymo and Beatrice Weder (2003). A Free Press Is Bad News for Corruption. *Journal of Public Economics* 87(7-8): 1801-1824.

Bruni, Luigino and Luca Stanca (2006). Income Aspirations, Television and Happiness: Evidence from the World Values Survey. *Kyklos* 59(2): 209-225.

Bruni, Luigino and Luca Stanca (2008). Watching Alone: Relational Goods, Television and Happiness. *Journal of Economic Behavior and Organization* 65(3-4): 506-528.

Bruns, Christian and Oliver Himmler (2008). Television Markets and the Distribution of Public Spending. Working Paper, Goettingen University.

Bryant, Jennings and Susan Thompson (2002). *Fundamentals of Media Effects*. Boston, MA: McGraw-Hill.

Bryant, W. Keith and Jennifer L. Gerner (1981). Television Use by Adults and Children - a Multivariate-Analysis. *Journal of Consumer Research* 8(2): 154-161.

Burroughs, James E., L. J. Shrum and Aric Rindfleisch (2002). Does Television Viewing Promote Materialism? Cultivating American Perceptions of the Good Life. *Advances in Consumer Research* 29: 442-443.

Camerer, Colin F., Samuel Issacharoff, George Loewenstein, Ted O'Donoghue and Matthew Rabin (2003). Regulation for Conservatives: Behavioral Economics and the Case For "Asymmetric Paternalism". *University of Pennsylvania Law Review* 151(3): 1211-1254.

Campaign Media Analysis Group (2008). Cmag-Eye. The Advertising Research Newsletter for Politics, Public Affairs and Advocacy Professionals (December 2008). Available online at http://www.tnsmi-cmag.com/news.asp (accessed on January, 25).

Center for Responsive Politics (2009). Banking on Becoming President. Available online at http://www.opensecrets.org/pres08/index.php (accessed on March 02, 2009).

Chang, LinChiat and Jon A. Krosnick (2003). Measuring the Frequency of Regular Behaviors: Comparing The "Typical Week" To The "Past Week". *Sociological Methodology* 33: 55-80.

Choi, James J., David Laibson, Brigitte C. Madrian and Andrew Metrick (2003). Optimal Defaults. *American Economic Review* 93(2): 180-185.

Choi, James J., David Laibson, Brigitte C. Madrian and Andrew Metrick (2004). For Better or for Worse: Default Effects and 401(K) Savings Behavior. In: David A. Wise (ed.). *Perspectives in the Economics of Aging*. Chicago, IL: University of Chicago Press: 94-107.

Colored American (1840). Editorial: "the Penny Press". *Colored American*, August 8, 1840.

Congleton, Roger D. (2001). Rational Ignorance, Rational Voter Expectations, and Public Policy: A Discrete Informational Foundation for Fiscal Illusion. *Public Choice* 107(1-2): 35-64.

Connolly, Sara and Shaun P. Hargreaves Heap (2007). Cross Country Differences in Trust in Television and the Governance of Public Broadcasters. *Kyklos* 60(1): 3-14.

Corneo, Giacomo (2005). Work and Television. *European Journal of Political Economy* 21(1): 99-113.

Crain, W. Mark and Brian L. Goff (1986). Televising Legislatures: An Economic Analysis. *Journal of Law and Economics* 29(2): 405-421.

Csikszentmihalyi, Mihaly and Robert Kubey (1981). Television and the Rest of Life - a Systematic Comparison of Subjective Experience. *Public Opinion Quarterly* 45(3): 317-328.

Cutler, David M., Edward L. Glaeser and Jesse M. Shapiro (2003). Why Have Americans Become More Obese? *Journal of Economic Perspectives* 17(3): 93-118.

Debreu, Gerard (1959). *Theory of Value: An Axiomatic Analysis of Economic Equilibrium*. New York: John Wiley & Sons.

Dekel, Eddie, Barton Lipman and Aldo Rustichini (2009). Temptation-Driven Preferences. *Review of Economic Studies*, forthcoming.

DellaVigna, Stefano (2009). Psychology and Economics: Evidence from the Field. *Journal of Economic Literature*, forthcoming.

DellaVigna, Stefano and Ulrike Malmendier (2006). Paying Not to Go to the Gym. *American Economic Review* 96(3): 694-719.

DellaVigna, Stefano and M. Daniele Paserman (2005). Job Search and Impatience. *Journal of Labor Economics* 23(3): 527-588.

DeSerpa, Allan C. (1971). Theory of Economics of Time. *The Economic Journal* 81(324): 828-846.

Djankov, Simeon, Caralee McLiesh, Tatiana Nenova and Andrei Shleifer (2003). Who Owns the Media? *Journal of Law and Economics* 46(2): 341-381.

Downs, Anthony (1957a). *An Economic Theory of Democracy*. New York: Harper.

Downs, Anthony (1957b). An Economic Theory of Political Action in a Democracy. *The Journal of Political Economy* 65(2): 135-150.

Druckman, James N. (2005). Media Matter: How Newspapers and Television News Cover Campaigns and Influence Voters. *Political Communication* 22(4): 463-481.

Dyck, Alexander, David Moss and Luigi Zingales (2008a). Media Versus Special Interests. NBER Working Papers No. 14360, Cambridge, MA: National Bureau of Economic Research.

Dyck, Alexander, Natalya Volchkova and Luigi Zingales (2008b). The Corporate Governance Role of the Media: Evidence from Russia. *Journal of Finance* 63(3): 1093-1135.

Easterlin, Richard A. (2001). Income and Happiness: Towards a Unified Theory. *Economic Journal* 111(473): 465-484.

Eichenberger, Reiner and Angel Serna (1996). Random Errors, Dirty Information, and Politics. *Public Choice* 86(1-2): 137-156.

Eichenberger, Reinhard (1992). *Verhaltensanomalien und Wirtschaftswissenschaft: Herausforderung, Reaktionen, Perspektiven*. Wiesbaden: Deutscher Universitäts-Verlag.

Ekelund, Robert B. Jr. and John Keith Watson (1994). Household Production and Consumption of News-Information Services: An Empirical Study. *Eastern Economic Journal* 20(1): 11-19.

Elster, Jon (1979). *Ulysses and the Sirens: Studies in Rationality and Irrationality*. Cambridge: Cambridge University Press.

Espe, Hartmut and Margarete Seiwert (1987). Television Viewing Types, General Life Satisfaction, and Viewing Amount: An Empirical Study in West-Germany. *Communications: The European Journal of Communication Research* 13: 95-110.

European Values Study Group and World Values Survey Association (2006). European and World Values Surveys Four-Wave Integrated Data File, 1981-2004, V.20060423. Aggregate File Producers: Análisis Sociológicos Económicos y Políticos (ASEP) and JD Systems (JDS), Madrid, Spain/Tilburg University, Tilburg, The Netherlands. Data Files Suppliers: Analisis Sociologicos Economicos y Politicos (ASEP) and JD Systems (JDS), Madrid, Spain / Tillburg University, Tillburg, The Netherlands / Zentralarchiv fur Empirische Sozialforschung (ZA), Cologne, Germany. Aggregate File Distributors: Análisis Sociológicos Económicos y Políticos (ASEP) and JD Systems (JDS), Madrid, Spain / Tillburg University, Tilburg, The Netherlands / Zentralarchiv für Empirische Sozialforschung (ZA) Cologne, Germany.

Eurostat (2003). Cinema, TV and Radio in the EU. Statistics on Audiovisual Services. Data 1980–2002. Luxembourg: Office for Official Publications of the European Communities.

Eurostat (2004). Guidelines on Harmonised European Time Use Surveys. 2004 Edition. Working Papers and Studies, Theme 3: Population and Social Conditions, Luxembourg: Office for Official Publications of the European Communities.

Eurostat (2009). Harmonised European Time Use Surveys. 2008 Guidelines. Eurostat Methodologies and Working Papers, Luxembourg: Office for Official Publications of the European Communities.

Falkinger, Josef (2008). Limited Attention as a Scarce Resource in Information-Rich Economies. *Economic Journal* 118(532): 1596-1620.

Fang, Hanming and Dan Silverman (2004). Time-Inconsistency and Welfare Program Participation: Evidence from the NLSY. Cowles Foundation Discussion Paper No. 1465, Cowles Foundation for Research in Economics at Yale University.

Fengler, Susanne and Stephan Russ-Mohl (2005). *Der Journalist als "Homo Oeconomicus"*. Konstanz: UVK Verlagsgesellschaft.

Filistrucchi, Lapo (2005). The Impact of the Internet on the Market for Daily Newspapers in Italy. EUI Working Paper ECO No. 2005/12, European University Institute.

Finn, Seth (1992). Television Addiction? An Evaluation of 4 Competing Media-Use Models. *Journalism Quarterly* 69(2): 422-435.

Fischer, Claude S. (1992). *America Calling: A Social History of the Telephone to 1940*. Berkeley, CA: University of California Press.

Fisher, Kimberly, Jonathan Gershuny and Anne H. Gauthier (2009). Multinational Time Use Study. User's Guide and Documentation. Version 3. Mimeo, Centre for Time Use Research, University of Oxford.

Frank, Robert H. (1999). *Luxury Fever: Why Money Fails to Satisfy in an Era of Excess*. New York, NY: Free Press.

Frederick, Shane (2003). Time Preference and Identity. In: Roy F. Baumeister, George Loewenstein and Daniel Read (eds). *Time and Decision: Economic and Psychological Perspectives on Intertemporal Choice*. New York: Russell Sage Foundation: 89-113.

Frederick, Shane, George Loewenstein and Ted O'Donoghue (2002). Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature* 40(2): 351-401.

Frey, Bruno S. (1995). *Economics as a Science of Human Behaviour. Towards a New Social Science Paradigm*. Boston: Kluwer.

Frey, Bruno S. (2008). *Happiness Research: A Revolution in Economics*. Cambridge, MA: MIT Press.

Frey, Bruno S. and Matthias Benz (2004). From Imperialism to Inspiration: A Survey of Economics and Psychology. In: John B. Davis, Alain Marciano and Jochen Runde (eds). *The Elgar Companion to Economics and Philosophy*. Cheltenham, UK and Northampton, MA: Edward Elgar: 61-83.

Frey, Bruno S. and Reiner Eichenberger (1994). Economic Incentives Transform Psychological Anomalies. *Journal of Economic Behavior and Organization* 23(2): 215-234.

Frey, Bruno S. and Simon Luechinger (2007). Concepts of Happiness and Their Measurement. In: Frank Beckenbach, Ulrich Hampicke, Christian Leipert, Georg Meran, Jürg Minsch, Hans G. Nutzinger, Reinhard Pfriem, Joachim Weimann, Franz Wirl and Ulrich Witt (eds). *Jahrbuch Ökologische Ökonomik Band 5. Soziale Nachhaltigkeit*. Marburg, Germany: Metropolis Verlag: 219-237.

Frey, Bruno S. and Alois Stutzer (2001). Economics and Psychology: From Imperialism to Inspired Economics. *Philosophie économique* 2(4): 5-22.

Frey, Bruno S. and Alois Stutzer (2002a). *Happiness and Economics: How the Economy and Institutions Affect Well-Being*. Princeton, NJ: Princeton University Press.

Frey, Bruno S. and Alois Stutzer (2002b). What Can Economists Learn from Happiness Research? *Journal of Economic Literature* 40(2): 402-435.

Frey, Bruno S. and Alois Stutzer (eds) (2007). *Economics and Psychology. A Promising New Cross-Disciplinary Field*. Cambridge: MIT Press.

Frey, Bruno S. and Alois Stutzer (2008). Economic Consequences of Mispredicting Utility. WWZ Working Paper No. 01/08, Center of Business and Economics (WWZ), University of Basel.

Fudenberg, Drew and David K. Levine (2006). A Dual-Self Model of Impulse Control. *American Economic Review* 96(5): 1449-1476.

Gailliot, Matthew T., Roy F. Baumeister, C. Nathan DeWall, Jon K. Maner, E. Ashby Plant, Dianne M. Tice, Lauren E. Brewer and Brandon J. Schmeichel (2007). Self-Control Relies on Glucose as a Limited Energy Source: Willpower Is More Than a Metaphor. *Journal of Personality and Social Psychology* 92(2): 325-336.

Gentzkow, Matthew (2006). Television and Voter Turnout. *Quarterly Journal of Economics* 121(3): 931-972.

Gentzkow, Matthew (2007). Valuing New Goods in a Model with Complementarity: Online Newspapers. *American Economic Review* 97(3): 713-744.

Gentzkow, Matthew, Edward L. Glaeser and Claudia Goldin (2006). The Rise of the Fourth Estate: How Newspapers Became Informative and Why It Mattered. In: Edward L. Glaeser and Claudia Goldin (eds). *Corruption and Reform: Lessons from America's Economic History*. Chicago, IL: University of Chicago Press.

Gentzkow, Matthew and Jesse M. Shapiro (2006). Media Bias and Reputation. *Journal of Political Economy* 114(2): 280-316.

Gentzkow, Matthew and Jesse M. Shapiro (2007). What Drives Media Slant? Evidence from U.S. Daily Newspapers. Working Paper, University of Chicago Graduate School of Business.
George, Lisa M. (2006). The Internet and the Market for Daily Newspapers. Working Paper, Department of Economics, Hunter College.
George, Lisa M. (2007). What's Fit to Print: The Effect of Ownership Concentration on Product Variety in Daily Newspaper Markets. *Information Economics and Policy* 19(3-4): 285-303.
George, Lisa M. and Joel Waldfogel (2003). Who Affects Whom in Daily Newspaper Markets? *Journal of Political Economy* 111(4): 765-784.
George, Lisa M. and Joel Waldfogel (2006). The New York Times and the Market for Local Newspapers. *American Economic Review* 96(1): 435-447.
George, Lisa M. and Joel Waldfogel (2008). National Media and Local Political Participation: The Case of the New York Times. In: Roumeen Islam (ed.). *Information and Public Choice: From Media Markets to Policy Making*. Washington, DC: World Bank Publications: 33-48.
Gerber, Alan, Dean Karlan and Daniel Bergan (2009). Does the Media Matter? A Field Experiment Measuring the Effect of Newspapers on Voting Behavior and Political Opinions. *American Economic Journal: Applied Economics*, forthcoming.
Gerbner, George, Larry Gross, Michael Morgan and Nancy Signorielli (1980). The Mainstreaming of America: Violence Profile No 11. *Journal of Communication* 30(3): 10-29.
Gerbner, George, Larry Gross, Michael Morgan, Nancy Signorielli and James Shanahan (2002). Growing up with Television: Cultivation Processes. In: Jennings Bryant and Dolf Zillmann (eds). *Media Effects. Advances in Theory and Research*. Mahwah, NJ: Lawrence Erlbaum Associates: 43-67.
Gfk Switzerland (2009a). Radiocontrol. Mimeo, Hergiswil: Gfk Switzerland.
Gfk Switzerland (2009b). Telecontrol. Mimeo, Hergiswil: Gfk Switzerland.
Glaeser, Edward L. (2006). Paternalism and Psychology. *University of Chicago Law Review* 73(1): 133-156.
Goolsbee, Austan and Peter J. Klenow (2006). Valuing Consumer Products by the Time Spent Using Them: An Application to the Internet. *American Economic Review* 96(2): 108-113.
Goolsbee, Austan and Amil Petrin (2004). The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV. *Econometrica* 72(2): 351-381.
Gørtz, Mette (2006). Leisure, Household Production, Consumption and Economic Well-Being. PhD Thesis, Department of Economics, University of Copenhagen.
Gottfredson, Michael R. and Travis Hirschi (1990). *A General Theory of Crime*. Stanford, CA: Stanford University Press.
Graber, Doris A. (2006). *Mass Media and American Politics*. 7th ed. Washington, D.C.: CQ Press.
Graham, John W. and Carole A. Green (1984). Estimating the Parameters of a Household Production Function with Joint Products. *Review of Economics and Statistics* 66(2): 277-282.
Grahn, Almut, Andreas Lehmann, Edgar Schmitz and Carsten Breinker (2003). *MIT - Medien im Tagesablauf 2003*. Cologne, Germany: IP Germany.
Gronau, Reuben (1977). Leisure, Home Production, and Work - the Theory of the Allocation of Time Revisited. *Journal of Political Economy* 85(6): 1099-1123.
Gronau, Reuben (1980). Home Production - a Forgotten Industry. *Review of Economics and Statistics* 62(3): 408-416.

Gronau, Reuben (1986). Home Production - a Survey. In: Orley Ashenfelter and Richard Layard (eds). *Handbook of Labor Economics. Volumes 1*. Amsterdam: North-Holland: 273-304.

Gronau, Reuben (1997). The Theory of Home Production: The Past Ten Years. *Journal of Labor Economics* 15(2): 197-205.

Gronau, Reuben and Daniel S. Hamermesh (2006). Time Vs. Goods: The Value of Measuring Household Production Technologies. *Review of Income and Wealth* 52(1): 1-16.

Gronau, Reuben and Daniel S. Hamermesh (2008). The Demand for Variety: A Household Production Perspective. *Review of Economics and Statistics* 90(3): 562-572.

Gruber, Jonathan and Sendhil Mullainathan (2005). Do Cigarette Taxes Make Smokers Happier? *B.E. Journals in Economic Analysis and Policy: Advances in Economic Analysis and Policy* 5(1): 1-43.

Gul, Faruk and Wolfgang Pesendorfer (2001). Temptation and Self-Control. *Econometrica* 69(6): 1403-1435.

Gul, Faruk and Wolfgang Pesendorfer (2005). A Simple Theory of Temptation and Self-Control. Working Paper, UCLA Department of Economics.

Gunter, Barrie (1994). The Question of Media Violence. In: Jennings Bryant and Dolf Zillmann (eds). *Media Effects. Advances in Theory and Research*. Hillsdale, NJ: Lawrence Erlbaum Associates: 163-211.

Gwartney, James D., Robert A. Lawson, Russell S. Sobel and Peter T. Leeson (2007). *Economic Freedom of the World: 2007 Annual Report*. Vancouver, BC: The Fraser Institute. Data retreived from www.freetheworld.com (accessed on May 15, 2008).

Hallberg, Daniel (2003). Synchronous Leisure, Jointness and Household Labor Supply. *Labour Economics* 10(2): 185-203.

Hamermesh, Daniel S., Harley Frazis and Jay Stewart (2005). Data Watch: The American Time Use Survey. *Journal of Economic Perspectives* 19(1): 221-232.

Hamilton, James T. (2004). *All the News That's Fit to Sell. How the Market Transforms Information into News*. Princeton, NJ: Princeton University Press.

Hargreaves Heap, Shaun P. (2005). Television in a Digital Age: What Role for Public Service Broadcasting? *Economic Policy* 41: 111-147.

Heinrich, Jürgen (1994). *Medienökonomie*. Opladen, Germany: Westdeutscher Verlag.

Hennigan, Karen M., Linda Heath, J. D. Wharton, Marlyn L. Delrosario, Thomas D. Cook and Bobby J. Calder (1982). Impact of the Introduction of Television on Crime in the United-States: Empirical-Findings and Theoretical Implications. *Journal of Personality and Social Psychology* 42(3): 461-477.

Heston, Alan, Robert Summers and Bettina Aten (2006). Penn Word Table Version 6.2. Mimeo, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.

HETUS (2008). Harmonised Euopean Time Use Survey. Statistics: Pre-Prepared Tables. Available online at https://www.testh2.scb.se/tus/tus/Statistics.html (accessed on December 19, 2008).

Hill, Martha S. and F. Thomas Juster (1985). Constraints and Complementarities in Time Use. In: F. Thomas Juster and Frank P. Stafford (eds). *Time, Goods, and Well-Being*. Ann Arbor, MI: University of Michigan Press: 439-470.

Hirschi, Travis (2004). Self-Control and Crime. In: Roy F. Baumeister and Kathleen D. Vohs (eds). *Handbook of Self-Regulation: Research, Theory, and Applications*. New York: Guilford.

Holtz-Bacha, Christina and Pippa Norris (2001). "To Entertain, Inform, and Educate": Still the Role of Public Television. *Political Communication* 18(2): 123-140.

Hoogendoorn, Adriaan W. (2006). Design Effects in People-Meter Panel Research. *Communications* 31(2006): 409-424.
Horvath, Cary W. (2004). Measuring Television Addiction. *Journal of Broadcasting & Electronic Media* 48(3): 378-398.
Hosp, Gerald (2005). *Medienökonomik: Medienkonzentration, Zensur und Soziale Kosten des Journalismus*. Konstanz: UVK Verlagsgesellschaft.
IP Network (ed.) (2004). *Television 2004: International Keyfacts*. Cologne, Germany: IP Network.
IP Network (ed.) (2006). *Television 2006: International Keyfacts*. Cologne, Germany: IP Network.
IP Network (ed.) (2007). *Television 2007: International Keyfacts*. Cologne, Germany: IP Network.
IP Network (ed.) (several years). *Television: International Keyfacts*. Cologne, Germany: IP Network.
Jäckel, Michael (1992). Mediennutzung als Niedrigkostensituation. Anmerkungen zum Nutzen- und Belohnungsansatz. *Medienpsychologie: Zeitschrift für Individual and Massenkommunikation* 4(4): 246-266.
Jara-Diaz, Sergio R., Marcela A. Munizaga, Paulina Greeven, Reinaldo Guerra and Kay Axhausen (2008). Estimating the Value of Leisure from a Time Allocation Model. *Transportation Research: Part B* 42(10): 946-957.
Jegen, Reto and Bruno S. Frey (2004). TV-Konsum und Rationalität. In: Gabriele Siegert and Frank Losig (eds). *Zwischen Marktversagen und Medienvielfalt. Medienmärkte im Fokus neuer medienökonomischer Anwendungen*. Baden-Baden, Germany: Nomos: 150-166.
Jenkins, Stephen P. and Lars Osberg (2005). Nobody to Play With? The Implications of Leisure Coordination. In: Daniel S. Hamermesh and Gerard A. Pfann (eds). *The Economics of Time Use*. Amsterdam and Boston: Elsevier.
Jensen-Campbell, Lauri A., Jennifer M. Knack, Amy M. Waldrip and Shaun D. Campbell (2007). Do Big Five Personality Traits Associated with Self-Control Influence the Regulation of Anger and Aggression? *Journal of Research in Personality* 41(2): 403-424.
Johnson, Jeffrey G., Patricia Cohen, Elizabeth M. Smailes, Stepanie Kasen and Judith S. Brook (2002). Television Viewing and Aggressive Behavior During Adolescence and Adulthood. *Science* 295: 2468-2471.
Jowell, Roger and the Central Co-ordinating Team (2003). European Social Survey 2002/2003: Technical Report. Centre for Comparative Social Surveys, City University, London.
Jowell, Roger and the Central Co-ordinating Team (2005). European Social Survey 2004/2005: Technical Report. Centre for Comparative Social Surveys, City University, London.
Juster, F. Thomas (1985a). Preferences for Work and Leisure. In: F. Thomas Juster and Frank P. Stafford (eds). *Time, Goods, and Well-Being*. Ann Arbor, MI: University of Michigan Press: 333-351.
Juster, F. Thomas (1985b). The Validity and Quality of Time Use Estimates Obtained from Recall Diaries. In: F. Thomas Juster and Frank P. Stafford (eds). *Time, Goods, and Well-Being*. Ann Arbor, MI: University of Michigan Press: 63-91.
Juster, F. Thomas (1986). Response Errors in the Measurement of Time Use. *Journal of the American Statistical Association* 81(394): 390-402.
Juster, F. Thomas, Hiromi Ono and Frank P. Stafford (2003). An Assessment of Alternative Measures of Time Use. *Sociological Methodology* 33: 19-54.

Juster, F. Thomas and Frank P. Stafford (1991). The Allocation of Time: Empirical Findings, Behavioral Models, and Problems of Measurement. *Journal of Economic Literature* 29(2): 471-522.

Kahneman, Daniel, Alan B. Krueger, David A. Schkade, Norbert Schwarz and Arthur A. Stone (2004a). The Day Reconstruction Method (DRM): Instrument Documentation. Mimeo, Princeton University.

Kahneman, Daniel, Alan B. Krueger, David A. Schkade, Norbert Schwarz and Arthur A. Stone (2004b). A Survey Method for Characterizing Daily Life Experience: The Day Reconstruction Method. *Science* 306(5702): 1776-1780.

Kahneman, Daniel, Peter P. Wakker and Rakesh Sarin (1997). Back to Bentham? Explorations of Experienced Utility. *Quarterly Journal of Economics* 112(2): 375-405.

Kaiser, Ulrich (2006). Magazines and Their Companion Websites: Competing Outlet Channels? *Review of Marketing Science* 4: 1-24.

Kaiser, Ulrich and Hans Christian Kongsted (2005). Do Magazines' "Companion Websites" Cannibalize the Demand for the Print Version? ZEW Discussion Paper No. 05-49, ZEW - Center for European Economic Research.

Kan, Man Yee and Stephen Pudney (2008). Measurement Error in Stylized and Diary Data on Time Use. *Sociological Methodology* 38(1): 101-132.

Kasser, Tim (2002). *The High Price of Materialism*. Cambridge, MA: MIT Press.

Keeter, Scott (1987). The Illusion of Intimacy - Television and the Role of Candidate Personal Qualities in Voter Choice. *Public Opinion Quarterly* 51(3): 344-358.

Kiefer, Marie Luise (2001). *Medienökonomik. Einführung in eine ökonomische Theorie der Medien*. München, Germany: R. Oldenbourg Verlag.

Kiefer, Marie Luise (2003). Medienfunktionen als meritorische Güter. *Medien Journal. Zeitschrift für Kommunikationskultur* 27(3): 31-46.

Kitzinger, Jenny (2004). Audience and Readership Reserach. In: John D.H. Downing, Denis McQuail, Philip Schlesinger and Ellen Wartella (eds). *The Sage Handbook of Media Studies*. Thousand Oaks: Sage: 167-181.

Knoch, Daria and Ernst Fehr (2007). Resisting the Power of Temptations - the Right Prefrontal Cortex and Self-Control. *Reward and Decision Making in Corticobasal Ganglia Networks* 1104: 123-134.

Kubey, Robert (1996). Television Dependence, Diagnosis, and Prevention: With Commentary on Video Games, Pornography, and Media Education. In: Tannis M. Williams (ed.). *Tuning into Young Viewers: Social Science Perspectives on Television*. Thousand Oaks, CA: Sage: 221-260.

Kubey, Robert and Mihaly Csikszentmihalyi (1990). *Television and the Quality of Life. How Viewing Shapes Everyday Experience*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Kubey, Robert and Mihaly Csikszentmihalyi (2002). Television Addiction Is No Mere Metaphor. *Scientific American* 286(2): 74-80.

Laibson, David (1997). Golden Eggs and Hyperbolic Discounting. *Quarterly Journal of Economics* 112(2): 443-477.

Laibson, David, Andrea Repetto and Jeremy Tobacman (2009). Estimating Discount Functions with Consumption Choices over the Lifecycle. *American Economic Review*, forthcoming.

Lamas, Carlos (2005). The Value of Coincidental Surveys to Monitor the Validity of TV Meter Panel Measurements. Paper presented at the EMRO Conference 2005, Kwa Maritane, South Africa.

Lancaster, Kelvin J. (1966). A New Approach to Consumer Theory. *Journal of Political Economy* 74(2): 132-157.

Layard, Richard (2005). *Happiness: Lessons from a New Science*. New York, NY: Penguin.

Lazear, Edward P. (2000). Economic Imperialism. *Quarterly Journal of Economics* 115(1): 99-146.

Leeson, Peter T. (2008). Media Freedom, Political Knowledge, and Participation. *Journal of Economic Perspectives* 22(2): 155-169.

Lelkes, Orsolya (2006). Knowing What Is Good for You: Empirical Analysis of Personal Preferences and The "Objective Good". *Journal of Socio-Economics* 35(2): 285-307.

Lichter, S. Robert, Linda S. Lichter and Stanley Rothman (1994). *Prime Time: How TV Portrays American Culture*. Washington, DC: Regnery.

List, John A. (2003). Does Market Experience Eliminate Market Anomalies? *Quarterly Journal of Economics* 118(1): 41-71.

Liu, Yong, Daniel S. Putler and Charles B. Weinberg (2004). Is Having More Channels Really Better? A Model of Competition among Commercial Television Broadcasters. *Marketing Science* 23(1): 120-133.

Liu, Yong, Daniel S. Putler and Charles B. Weinberg (2006). The Welfare and Equity Implications of Competition in Television Broadcasting: The Role of Viewer Tastes. *Journal of Cultural Economics* 30(2): 127-140.

Loewenstein, George, Ted O'Donoghue and Matthew Rabin (2003). Projection Bias in Predicting Future Utility. *Quarterly Journal of Economics* 118(4): 1209-1248.

Loewenstein, George and Drazen Prelec (1992). Anomalies in Intertemporal Choice: Evidence and an Interpretation. *Quarterly Journal of Economics* 107(2): 573-597.

Luechinger, Simon (2007). The Life Satisfaction Approach to Valuing Public Goods: Theoretical Discussion and Empirical Applications to Air Pollution, Flood Disasters and Terrorism. PhD Thesis, Faculty of Economics, University of Zurich.

MacKinnon, David P., Chondra M. Lockwood, Jeanne M. Hoffman, Stephen G. West and Virgil Sheets (2002). A Comparison of Methods to Test Mediation and Other Intervening Variable Effects. *Psychological Methods* 7(1): 83-104.

MacKinnon, David P., Ghulam Warsi and James H. Dwyer (1995). A Simulation Study of Mediated Effect Measures. *Multivariate Behavioral Research* 30(1): 41-62.

Martin, Andrew J. and Ian D. Smith (1997). Television Violence: A Review, Suggested Research Design and Statistical Approach. *Australian Journal of Social Issues* 32(4): 407-430.

Mathewson, G. Franklin (1972). A Consumer Theory of Demand for the Media. *Journal of Business* 45(2): 212-224.

Matsusaka, John G. (1995). Explaining Voter Turnout Patterns: An Information Theory. *Public Choice* 84(1-2): 91-117.

McCabe, Lisa, Marisol Cunnington and Jeanne Brooks-Gunn (2004). The Development of Self-Regulation in Young Children: Individual Characteristics and Environmental Contexts. In: Roy F. Baumeister and Kathleen D. Vohs (eds). *Handbook of Self-Regulation: Research, Theory, and Applications*. New York: Guilford: 341-357.

McClure, Samuel M., David Laibson, George Loewenstein and Jonathan D. Cohen (2004). Separate Neural Systems Value Immediate and Delayed Monetary Rewards. *Science* 306(5695): 503-507.

McCombs, Maxwell E. (1988). Concentration, Monopoly, and Content. In: Robert G. Picard, James P. Winter, Maxwell E. McCombs and Stephen Lacy (eds). *Press Concentration and Monopoly: New Perspectives on Newspaper Ownership and Operation*. Norwood, NJ: Ablex Publishing Corporation: 129-137.

McCrae, Robert R. and Paul T. Costa (1999). A Five-Factor Theory of Personality. In: Lawrence A. Pervin and Oliver P. John (eds). *Handbook of Personality: Theory and Research*. New York: Guilford Press: 139-153.

McCullough, Michael E. and Brian L. B. Willoughby (2009). Religion, Self-Regulation, and Self-Control: Associations, Explanations, and Implications. *Psychological Bulletin* 135(1): 69-93.

McHenry, James (1824). *American Monthly Magazine* 2(July 1824): 1.

McIlwraith, Robert D. (1998). "I'm Addicted to Television": The Personality, Imagination, and TV Watching Patterns of Self-Identified TV Addicts. *Journal of Broadcasting & Electronic Media* 42(3): 371-386.

McIlwraith, Robert D., Robin S. Jacobvitz, Robert Kubey and Alison Alexander (1991). Television Addiction - Theories and Data Behind the Ubiquitous Metaphor. *American Behavioral Scientist* 35(2): 104-121.

McMillan, John and Pablo Zoido (2004). How to Subvert Democracy: Montesinos in Peru. *Journal of Economic Perspectives* 18(4): 69-92.

Meier, Stephan and Charles Sprenger (2008). Charging Myopically Ahead: Evidence on Present-Biased Preferences and Credit Card Borrowing. Working Paper, Columbia Business School.

Michael, Robert T. and Gary S. Becker (1973). On the New Theory of Consumer Behavior. *Swedish Journal of Economics* 75(4): 378-396.

Mincer, Jacob (1962). Labor Force Participation of Married Women. In: Universities-National Bureau Committee for Economic Research (ed.). *Aspects of Labor Economics: A Conference of the Universities-National Bureau Committee for Economic Research*. Princeton: Princeton University Press.

Mischel, Walter, Yuichi Shoda and Philip K. Peake (1988). The Nature of Adolescent Competencies Predicted by Preschool Delay of Gratification. *Journal of Personality and Social Psychology* 54(4): 687-696.

Morgan, Michael (1984). Heavy Television Viewing and Perceived Quality of Life. *Journalism Quarterly* 61(3): 499-504.

Mueller, Dennis C. (2003). *Public Choice III*. Cambridge, UK: Cambridge University Press.

Mullainathan, Sendhil and Andrei Shleifer (2005). The Market for News. *American Economic Review* 95(4): 1031-1053.

Muraven, Mark, Dianne M. Tice and Roy F. Baumeister (1998). Self-Control as Limited Resource: Regulatory Depletion Patterns. *Journal of Personality and Social Psychology* 74(3): 774-789.

Musgrave, Richard A. (2008). Merit Goods. In: Steven N. Durlauf and Lawrence E. Blume (eds). *The New Palgrave Dictionary of Economics. Second Edition*. Houndmills, UK: Palgrave Macmillan.

Newton, Ken (2002). Chapter 4: Media and Communications Questions. Questionnaire Development Report, European Social Survey.

Nickols, Sharon Y. and Monica Ayieko (1996). Spot Observation: Advantages and Disadvantages for Household Time Use Research. *Journal of Family and Economic Issues* 17(3/4): 281-295.

Norris, Pippa (2000). *A Virtuous Circle: Political Communications in Postindustrial Societies*. Cambridge: Cambridge University Press.

North, Douglass C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

Norton, Edward C., Hua Wang and Chunrong Ai (2004). Computing Interaction Effects and Standard Errors in Logit and Probit Models. *The Stata Journal* 4(2): 134-167.

O'Donoghue, Ted and Matthew Rabin (1999a). Addiction and Self Control. In: Jon Elster (ed.). *Addiction: Entries and Exits*. New York, NY: Russell Sage Foundation: 169-206.

O'Donoghue, Ted and Matthew Rabin (1999b). Doing It Now or Later. *American Economic Review* 89(1): 103-124.
O'Donoghue, Ted and Matthew Rabin (2001). Choice and Procrastination. *Quarterly Journal of Economics* 116(1): 121-160.
O'Donoghue, Ted and Matthew Rabin (2002). Addiction and Present-Biased Preferences. Working Paper E02-312, Economics Department, University of California, Berkeley.
O'Donoghue, Ted and Matthew Rabin (2003). Self Awareness and Self Control. In: Roy F. Baumeister, George Loewenstein and Daniel Read (eds). *Time and Decision: Economic and Psychological Perspectives on Intertemporal Choice*. New York: Russell Sage Foundation: 217-243.
O'Donoghue, Ted and Matthew Rabin (2005). Incentives and Self-Control. Working Paper, Cornell University and University of California at Berkley.
O'Guinn, Thomas C. and L. J. Shrum (1997). The Role of Television in the Construction of Consumer Reality. *Journal of Consumer Research* 23(4): 278-294.
Oaten, Megan and Ken Cheng (2006). Longitudinal Gains in Self-Regulation from Regular Physical Exercise. *British Journal of Health Psychology* 11: 717-733.
Oberholzer-Gee, Felix and Joel Waldfogel (2009). Media Markets and Localism: Does Local News En Espanol Boost Hispanic Voter Turnout? *American Economic Review*, forthcoming.
Okada, Erica Mina and Stephen J. Hoch (2004). Spending Time Versus Spending Money. *Journal of Consumer Research* 31(2): 313-323.
Olken, Benjamin A. (2008). Do Television and Radio Destroy Social Capital? Evidence from Indonesian Villages. Working Paper, Harvard University.
Olson, Mancur (1965). *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.
Orians, G. Harrison (1937). Censure of Fiction in American Romances and Magazines 1789-1810. *PMLA* 52(1): 195-214.
Ozga, S. Andrew (1960). Imperfect Markets through Lack of Knowledge. *Quarterly Journal of Economics* 74(1): 29-52.
Pashler, Harold E. (1998). *The Psychology of Attention*. 2nd printing. Cambridge, MA: MIT Press.
Patterson, Thomas E. (1993). *Out of Order*. New York: A. Knopf.
Persson, Torsten and Guido Tabellini (2000). *Political Economics: Explaining Economic Policy*. Cambridge, MA: MIT Press.
Pesendorfer, Wolfgang (2006). Behavioral Economics Comes of Age: A Review Essay on Advances in Behavioral Economics. *Journal of Economic Literature* 44(3): 712.
Petrin, Amil (2002). Improving Demand and Welfare Estimates with Utilization Data. Working Paper, University of Chicago.
Phelps, Edmund S. and Robert A. Pollak (1968). On Second-Best National Saving and Game-Equilibrium Growth. *Review of Economic Studies* 35(2): 185-199.
Picard, Robert G. (1989). *Media Economics. Concepts and Issues*. Newbury Park, CA: Sage Publications.
Picard, Robert G. (2006). Historical Trends and Patterns in Media Economics. In: Alan B. Albarran, Sylvia M. Chan-Olmsted and Michael O. Wirth (eds). *Handbook of Media Management and Economics*. Mahwah, NJ: Lawrence Erlbaum Associates: 23-36.
Pollak, Robert A. and Michael L. Wachter (1975). The Relevance of the Household Production Function and Its Implications for the Allocation of Time. *Journal of Political Economy* 83(2): 255-277.
Prat, Andrea and David Strömberg (2005). Commercial Television and Voter Information. CEPR Discussion Paper No. 4989, London: Centre for Economic Policy Research.

Press, Julie E. and Eleanor Townsley (1998). Wives' and Husbands' Housework Reporting - Gender, Class, and Social Desirability. *Gender & Society* 12(2): 188-218.
Prior, Markus (2003). Any Good News in Soft News? The Impact of Soft News Preference on Political Knowledge. *Political Communication* 20(2): 149-171.
Prior, Markus (2005). News Vs. Entertainment: How Increasing Media Choice Widens Gaps in Political Knowledge and Turnout. *American Journal of Political Science* 49(3): 577-592.
Putnam, Robert D. (1995). Tuning in, Tuning out - the Strange Disappearance of Social Capital in America. *Political Science & Politics* 28(4): 664-683.
Putnam, Robert D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.
Quah, Euston (1986). Persistent Problems in Measuring Household Production: Definition, Quantifying Joint Activities and Valuation Issues Are Solvable. *American Journal of Economics and Sociology* 45(2): 235-245.
Read, Daniel (2006). Which Side Are You On? The Ethics of Self-Command. *Journal of Economic Psychology* 27(5): 681-693.
Reid, Margaret G. (1934). *Economics of Household Production*. New York, NY: Wiley.
Reif, Karlheinz and Anna Melich (1993). Eurobarometer 31a: European Elections, 1989: Post-Election Survey, June-July 1989 [Computer File]. Conducted by Faits et Opinions, Paris. ICPSR ed. Ann Arbor, Ml: Inter-University Consortium for Political and Social Research [Producer and Distributor].
Reinemann, Carsten and Jürgen Wilke (2007). It's the Debates, Stupid! How the Introduction of Televised Debates Changed the Portrayal of Chancellor Candidates in the German Press, 1949-2005. *Harvard International Journal of Press-Politics* 12(4): 92-111.
Reuter, Jonathan and Eric Zitzewitz (2006). Do Ads Influence Editors? Advertising and Bias in the Financial Media. *Quarterly Journal of Economics* 121(1): 197-227.
Richins, Marsha L. (1987). Media, Materialism, and Human Happiness. *Advances in Consumer Research* 14: 352-356.
Riley, John G. (2001). Silver Signals: Twenty-Five Years of Screening and Signaling. *Journal of Economic Literature* 39(2): 432-478.
Robinson, John P. (1985). The Validity and Reliability of Diaries Versus Alternative Time Use Measures. In: F. Thomas Juster and Frank P. Stafford (eds). *Time, Goods, and Well-Being*. Ann Arbor, MI: University of Michigan Press: 33-62.
Robinson, John P. (1999). The Time-Diary Method: Structure and Uses. In: Wendy E. Pentland, Andrew S. Harvey, Powell Lawton and Mary Ann McColl (eds). *Time Use Research in the Social Sciences*. New York: Kluwer Academic / Plenum Publishers: 47-89.
Robinson, John P. and Geoffrey Godbey (1999). *Time for Life: The Surprising Ways Americans Use Their Time*. 2nd ed. University Park, PA: Pennsylvania State University Press.
Rubens, William (1989). We Don't Care About Research Quality Anymore. *Journal of Advertising Research* 29(1): Rc3-Rc6.
Rubin, Alan M. (2002). The Uses-and-Gratification Perspective of Media Effects. In: Jennings Bryant and Dolf Zillmann (eds). *Media Effects. Advances in Theory and Research*. Mahwah, NJ: Lawrence Erlbaum Associates: 525-548.
Rutenberg, Jim (2008). Obama Infomercial, a Closing Argument to the Everyman. *The New York Times*, October 28, 2008: 19.
Samuelson, Paul A. (1937). A Note on Measurement of Utility. *Review of Economic Studies* 4(2): 155-161.

Samuelson, Paul A. (1958). Aspects of Public-Expenditure Theories. *Review of Economics and Statistics* 40(4): 332-338.

Samuelson, Paul A. (1964). Public-Goods and Subscription TV - Correction of the Record. *Journal of Law & Economics* 7(1): 81-83.

Schmeichel, Brandon J. and Anne Zell (2007). Trait Self-Control Predicts Performance on Behavioral Tests of Self-Control. *Journal of Personality* 75(4): 743-755.

Schoenbach, Klaus (1996). The "Americanization" Of German Election Campaigns: Any Impact on the Voters? In: David E. Swanson and Paolo Mancini (eds). *Politics, Media, and Modern Democracy. An International Study of Innovation in Electoral Campaigning and Their Consequences*. Westport: Praeger.

Schulz, Winfried (2004). Reconstructing Mediatization as an Analytical Concept. *European Journal of Communication* 19(1): 87-101.

Schulz, Winfried, Reimar Zeh and Oliver Quiring (2005). Voters in a Changing Media Environment - a Data-Based Retrospective on Consequences of Media Change in Germany. *European Journal of Communication* 20(1): 55-88.

Selb, Peter, Georg Lutz, Marc Buehlmann, Marco Steenbergen, Philipp Leimgruber, Sarah Nicolet, Alexander Widmer, Dominique Joye, Florence Passy, Daniele Caramani and Oscar Mazzoleni (2008). Eidgenössische Wahlen 2007 - Nationale Nachbefragung [Maschinenlesbarer Datensatz]. Produktion: Universität Zürich, Institut für Politikwissenschaft - IPZ; Universität Bern, Institut für Politikwissenschaft - IPW; Université de Genève, Département de science politique; Université de Lausanne, Institut d'études politiques et internationales - IEPI; Universität St. Gallen, Institut für Politikwissenschaft; Ufficio di Statistica del Cantone Ticino, Bellinzona; Bundesamt für Statistik - BFS, Sektion sozioökonomische Analysen, Neuchâtel; Bundeskanzlei, Sektion Politische Rechte, Bern; FORS - Schweizer Stiftung für die Forschung in den Sozialwissenschaften, Lausanne. Finanzierung: Schweizerischer Nationalfonds zur Förderung der wissenschaftlichen Forschung. Verteilt durch FORS, Schweizer Stiftung für die Forschung in den Sozialwissenschaften, Lausanne.

Semetko, Holli A. (2004). Media, Public Opinion, and Political Action. In: John D.H. Downing, Denis McQuail, Philip Schlesinger and Ellen Wartella (eds). *The Sage Handbook of Media Studies*. Thousand Oaks: Sage: 351-374.

Semetko, Holli A. and Patti M. Valkenburg (2000). Framing European Politics: A Content Analysis of Press and Television News. *Journal of Communication* 50(2): 93-109.

Shapiro, Carl and Hal R. Varian (1999). *Information Rules. A Strategic Guide to the Network Economy*. Boston, MA: Harvard Business School Press.

Shapiro, Jesse M. (2005). Is There a Daily Discount Rate? Evidence from the Food Stamp Nutrition Cycle. *Journal of Public Economics* 89(2-3): 303-325.

Shaw, W. Douglass (1992). Searching for the Opportunity Cost of an Individual's Time. *Land Economics* 68(1): 107-115.

Shaw, W. Douglass and Peter Feather (1999). Possibilities for Including the Opportunity Cost of Time in Recreation Demand Systems. *Land Economics* 75(4): 592-602.

Shrum, L. J., James E. Burroughs and Aric Rindfleisch (2003). Does Television Promote Materialism? Cultivating Desire for the Good Life. Paper Presented at the Annual Conference of the International Communication Association, San Diego, Mass Communication Division.

Shrum, L. J., James E. Burroughs and Aric Rindfleisch (2005). Television's Cultivation of Material Values. *Journal of Consumer Research* 32(473-479).

Shui, Haiyan and Lawrence M. Ausubel (2004). Time Inconsistency in the Credit Card Market. Working Paper, University of Maryland.

Sigelman, Lee and David Bullock (1991). Candidates, Issues, Horse Races, and Hoopla - Presidential Campaign Coverage, 1888-1988. *American Politics Quarterly* 19(1): 5-32.

Signorielli, Nancy, George Gerbner and Michael Morgan (1995). Violence on Television - the Cultural Indicators Project. *Journal of Broadcasting & Electronic Media* 39(2): 278-283.

Simon, Daniel H. and Vrinda Kadiyali (2007). The Effect of a Magazine's Free Digital Content on Its Print Circulation: Cannibalization or Complementarity? *Information Economics and Policy* 19(3-4): 344-361.

Sirgy, M. Joseph, Dong-Jin Lee, Rustan Kosenko, H. Lee Meadow, Don Rahtz, Muris Cicic, Guang Xi Jin, Duygun Yarsuvat, David L. Blenkhorn and Newell Wright (1998). Does Television Viewership Play a Role in the Perception of Quality of Life? *Journal of Advertising* 27(1): 125-142.

Skiba, Paige and Jeremy Tobacman (2008). Payday Loans, Uncertainty, and Discounting: Explaining Patterns of Borrowing, Repayment, and Default. Working Paper, University of Pennsylvania.

Slembeck, Tilman and Jean-Robert Tyran (2004). Do Institutions Promote Rationality? An Experimental Study of the Three-Door Anomaly. *Journal of Economic Behavior and Organization* 54(3): 337-350.

Smith, Adam (1759). *The Theory of Moral Sentiments*. London: A. Millar; and A. Kincaid and J. Bell in Edinburgh.

Smith, Robin (1986). Television Addiction. In: Jennings Bryant and Dolf Zillmann (eds). *Perspectives on Media Effects*. Hillsdale, NJ: Lawrence Erlbaum Associates: 109-128.

Snyder, James M. and David Strömberg (2008). Press Coverage and Political Accountability. NBER Working Paper No. 13878, Cambridge, MA: National Bureau of Economic Research.

Sparks, Glenn G. and Cheri W. Sparks (2002). Effects of Media Violence. In: Jennings Bryant and Dolf Zillmann (eds). *Media Effects. Advances in Theory and Research*. Mahwah, NJ: Lawrence Erlbaum Associates: 269-285.

Stelter, Brian (2008). Cuomo to Sue Radio Ratings Company, Claiming Minorities Are Underrepresented. *The New York Times*, October 7, 2008: 28.

Stigler, George J. (1961). The Economics of Information. *Journal of Political Economy* 69(3): 213-225.

Stigler, George J. (1967). Imperfections in Capital Market. *Journal of Political Economy* 75(3): 287-292.

Stigler, George J. (1984). Economics - the Imperial Science? *Scandinavian Journal of Economics* 86(3): 301-313.

Stiglitz, Joseph E. (2000). The Contributions of the Economics of Information to Twentieth Century Economics. *Quarterly Journal of Economics* 115(4): 1441-1478.

Stiglitz, Joseph E. (2002). Information and the Change in the Paradigm in Economics. *American Economic Review* 92(3): 460-501.

Strömberg, David (2002). Distributing News and Political Influence. In: Simeon Djankov and Caralee McLiesh (eds). *The Right to Tell: The Role of Mass Media in Economic Development*. Washington, DC: World Bank Publications: 95-106.

Strömberg, David (2004a). Mass Media Competition, Political Competition, and Public Policy. *Review of Economic Studies* 71(1): 265-284.

Strömberg, David (2004b). Radio's Impact on Public Spending. *Quarterly Journal of Economics* 119(1): 189-221.

Stutzer, Alois (2004). The Role of Income Aspirations in Individual Happiness. *Journal of Economic Behavior and Organization* 54(1): 89-109.

Stutzer, Alois (2007). Limited Self-Control, Obesity and the Loss of Happiness. WWZ Discussion Paper No. 07/07, Center of Business and Economics (WWZ), University of Basel.

Stutzer, Alois and Bruno S. Frey (2007). What Happiness Research Can Tell Us About Self-Control Problems and Utility Misprediction. In: Bruno S. Frey and Alois Stutzer (eds). *Economics and Psychology. A Promising New Cross-Disciplinary Field*. Cambridge: MIT Press.

Sunstein, Cass R. (2000). Television and the Public Interest. *California Law Review* 88(2): 499-564.

Sunstein, Cass R. (2001). *Republic.com*. Princeton, NJ: Princeton University Press.

Sunstein, Cass R. (2007). *Republic.com 2.0*. Princeton, NJ: Princeton University Press.

Svendsen, Erik Nordahl (2002). The Regulation of Public Service Broadcasting, an Epra Inquiry. Paper prepared for the 16th EPRA meeting in Ljubljana, 24-25 October 2002.

Syfret, Toby (2006). Television Audience Measurement in Lebanon. Assessment of AGB Stat Ipsos TAM System. AGB Nielsen. http://www.agbnielsen.com/uploads/lebanon/Lebanese_Assesment.pdf (accessed on January 23, 2009).

Tangney, June P., Roy F. Baumeister and Angie Luzio Boone (2004). High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success. *Journal of Personality* 72(2): 271-324.

Tankard, James W. and Murray C. Harris (1980). A Discriminant-Analysis of Television Viewers and Non-Viewers. *Journal of Broadcasting* 24(3): 399-409.

Thaler, Richard H. (1992). *The Winner's Curse. Paradoxes and Anomalies of Economic Life*. New York, NY: Free Press.

Thaler, Richard H. and Hersh M. Shefrin (1981). An Economic Theory of Self-Control. *Journal of Political Economy* 89(2): 392-406.

Thaler, Richard H. and Cass R. Sunstein (2003). Libertarian Paternalism. *American Economic Review. Papers and Proceedings* 93(2): 175-179.

Tittle, Charles R., Michael R. Welch and Harold G. Grasmick (2008). Self-Control, Political Ideology, and Misbehavior: Unpacking the Effects of Conservative Identity. *Sociological Spectrum* 28(1): 4-35.

Tollison, Robert D., Mark Crain and Paul Pautler (1975). Information and Voting: An Empirical Note. *Public Choice* 24: 43-49.

Trappel, Josef (2008). Monitoring the Performance of the Media for Democracy - Subjects, Formats, Methods and Failures. In: Nirmala Rao Khadpekar (ed.). *Media Ethics. Global Dimensions*. Hyderabad: Icfai University Press: 32-45.

U.S. Census Bureau (2009). Statistical Abstract of the United States: 2009. Washington D.C.: U.S. Census Bureau.

UNESCO Institute for Statistics (2008). Newspapers. Available online at http://stats.uis.unesco.org/ (accessed on May 13, 2008).

Vohs, Kathleen D., Brandon J. Schmeichel, Noelle M. Nelson, Roy F. Baumeister, Jean M. Twenge and Dianne M. Tice (2008). Making Choices Impairs Subsequent Self-Control: A Limited-Resource Account of Decision Making, Self-Regulation, and Active Initiative. *Journal of Personality and Social Psychology* 94(5): 883-898.

Waldfogel, Joel (2003). Preference Externalities: An Empirical Study of Who Benefits Whom in Differentiated-Product Markets. *RAND Journal of Economics* 34(3): 557-568.

Waldfogel, Joel (2004). Who Benefits Whom in Local Television Markets? *Brookings-Wharton Papers on Urban Affairs* 2004: 257-305.

Waldfogel, Joel (2009). Lost on the Web: Does Web Distribution Stimulate or Depress Television Viewing? *Information Economics and Policy*, forthcoming.

Wattenberg, Martin Paul (1996). *The Decline of American Political Parties, 1952-1994*. Cambridge, MA: Harvard University Press.
Weimann, Gabriel (1996). Cable Comes to the Holy Land: The Impact on Cable TV on Israeli Viewers. *Journal of Broadcasting & Electronic Media* 40: 243-257.
Wilke, Jürgen and Carsten Reinemann (2001). Do the Candidates Matter? Long-Term Trends of Campaign Coverage - a Study of the German Press since 1949. *European Journal of Communication* 16(3): 291-314.
Williams, Ross and Sue Donath (1994). Simultaneous Uses of Time in Household Production. *Review of Income and Wealth* 40(4): 433-456.
Williams, Tannis Macbeth (ed.) (1986). *The Impact of Television. A Natural Experiment in Three Communities*. Orlando, FL: Academic Press.
Wilson, Timothy D. and Daniel T. Gilbert (2003). Affective Forecasting. In: M. Zanna (ed.). *Advances in Experimental Social Psychology*, vol. 35. New York: Elsevier: 345-411.
Winn, Marie (1977). *The Plug-in Drug: Television, Children, and the Family*. New York: Viking.
Winqvist, Karin (2004). How Europeans Spend Their Time. Everyday Life of Women and Men. Luxembourg: Office for Official Publications of the European Communities.
World Bank (several years). *World Development Indicators*. Washington, DC: The World Bank.
Young, Dannagal G. and Russell A. Tisinger (2006). Dispelling Late-Night Myths - News Consumption among Late-Night Comedy Viewers and the Predictors of Exposure to Various Late-Night Shows. *Harvard International Journal of Press-Politics* 11(3): 113-134.

Appendix

Table A1: Media Consumption and Personal Characteristics: Ordered Probit Regressions

Dependent variable: media use (categories)	Total TV		Total radio		Total newspapers		News TV		News radio		News newspapers	
	Coefficient	(z-value)	Coefficient	(z-value)	Coefficient	(z-value)	Coefficient	(z-value)	Coefficient	(z-value)	Coefficient	(z-value)
Working hours	-0.002**	(-7.05)	0.001**	(4.24)	0.000	(0.90)	-0.000	(-1.06)	0.001**	(5.48)	0.000	(1.62)
Employment status												
Paid work	Reference group											
Retired	0.491**	(35.80)	0.015	(1.06)	0.129**	(9.29)	0.286**	(20.92)	-0.008	(-0.58)	0.077**	(5.23)
Unemployed	0.445**	(26.08)	-0.129**	(-7.48)	0.030(*)	(1.70)	0.223**	(13.05)	-0.160**	(-8.91)	-0.030	(-1.58)
Permanently sick or disabled	0.540**	(21.02)	-0.068**	(-2.65)	-0.023	(-0.89)	0.309**	(12.35)	-0.090**	(-3.44)	-0.104**	(-3.77)
Housework, looking after children	0.335**	(25.74)	-0.061**	(-4.55)	-0.009	(-0.70)	0.165**	(12.59)	-0.079**	(-5.76)	-0.050**	(-3.48)
In education	-0.059**	(-3.51)	-0.272**	(-15.81)	0.031(*)	(1.76)	0.002	(0.11)	-0.230**	(-12.76)	0.093**	(4.98)
Community or military service	-0.025	(-0.35)	-0.063	(-0.85)	-0.042	(-0.57)	-0.081	(-1.09)	-0.77	(-1.02)	0.094	(1.21)
Education												
Not completed primary education	-0.194**	(-9.67)	-0.282**	(-13.56)	-0.622**	(-27.70)	-0.226**	(-11.30)	-0.190**	(-8.56)	-0.541**	(-22.03)
Primary or 1st stage of basic education	Reference group											
Lower secondary education	-0.009	(-0.73)	0.136**	(10.41)	0.160**	(12.11)	0.034**	(2.61)	0.065**	(4.79)	0.147**	(10.39)
Upper secondary education	-0.161**	(-12.65)	0.148**	(11.40)	0.272**	(20.67)	-0.006	(-0.45)	0.111**	(8.26)	0.304**	(21.66)
Post secondary, non-tertiary education	-0.271**	(-14.59)	0.065**	(3.45)	0.249**	(13.01)	-0.047*	(-2.48)	0.064**	(3.31)	0.313**	(15.51)
1st stage of tertiary education	-0.475**	(-31.55)	-0.045**	(-2.94)	0.284**	(18.32)	-0.133**	(-8.73)	0.041**	(2.62)	0.409**	(24.98)
2nd stage of tertiary education	-0.592**	(-28.72)	-0.122**	(-5.82)	0.242**	(11.42)	-0.265**	(-12.64)	0.038(*)	(1.79)	0.422**	(19.04)

Table to be continued

Continuation of Table A1

Household characteristics						
No children living at home	Reference group					
Children living at home	-0.071** (-6.97)	-0.064** (-6.18)	-0.122** (-11.61)	-0.045** (-4.36)	-0.014 (-1.29)	-0.066** (-5.95)
Living without partner	Reference group					
Living with partner	0.083** (9.02)	-0.026** (-2.78)	0.032** (3.36)	0.116** (12.55)	0.035** (3.65)	0.035** (3.49)
Political interest	0.024** (5.55)	0.066** (15.02)	0.246** (55.22)	0.360** (81.28)	0.241** (52.85)	0.422** (87.64)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country/wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	89,677	89,584	89,652	89,576	89,214	89,330
Pseudo R-squared	0.04	0.02	0.07	0.07	0.05	0.12

Notes: Ordered probit regressions. z-values in brackets. Political interest is coded from 0 (low) to 4 (high). Individual controls include variables for household income (log), size of household (square root), sex, age, age squared, area of living, citizenship. Dummy variables indicating missing observations for working hours, employment status, children, partner, education, political interest, household income, household size, sex, age, area of living and citizenship are included as well.

Significance levels: ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.

Data Source: European Social Survey (Jowell et al. 2003; 2005).

Table A2: State Ownership of TV and TV Consumption: Robustness Checks

Dependent variable: media use (minutes)	(A) Ordered probit		(B) OLS		(C) OLS		(D) OLS	
	Total TV	News TV	Total TV	News TV	Total TV	News TV	Total TV	News TV
	Coefficient (z-value)	Coefficient (z-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
State ownership of TV by share	-0.935**	-0.533(*)			-53.68**	-17.11**	-41.01**	-22.68*
	(-3.85)	(-1.69)			(-5.39)	(-4.09)	(-3.12)	(-2.88)
State ownership of TV by count			-90.42**	-34.28*				
			(-3.70)	(-2.66)				
GNI per capita (1000 int. $)	0.010**	0.019*	-0.01	0.49*	0.79**	0.82**	0.69*	0.74**
	(2.68)	(2.08)	(-0.03)	(2.05)	(3.23)	(3.31)	(2.66)	(2.98)
Unemployment rate	0.897	2.453(*)	-58.67	41.84	37.15	76.08(*)	19.32	-24.06
	(1.13)	(1.76)	(-0.86)	(1.20)	(0.86)	(1.87)	(0.15)	(-0.42)
Population (1 Mio.)	0.003*	-0.002	0.32**	-0.01	0.24**	-0.04	0.36*	-0.11
	(1.98)	(-0.85)	(2.93)	(-0.16)	(4.24)	(-0.95)	(2.65)	(-0.20)
State owned enterprise index	0.064**	0.025*	5.00**	1.33**	5.42**	1.51**	4.80**	1.42**
	(4.71)	(2.35)	(5.37)	(2.91)	(9.47)	(3.54)	(6.52)	(3.11)
No. of TV channels					-0.45**	-0.34**	-0.38*	-0.27**
					(-2.84)	(-4.03)	(-2.31)	(-4.64)
No. of radio stations							0.002	0.01**
							(0.40)	(3.44)
No. of daily newspaper titles							-0.05	-0.02
							(-1.19)	(-0.90)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant			158.65**	11.37*	126.52**	-1.10	129.21**	8.78
			(9.59)	(0.94)	(12.63)	(-0.09)	(9.44)	(0.70)
No. of observations	40,568	40,285	40,568	40,285	38,097	37.836	32,095	31,927
(Pseudo) R-squared	0.04	0.07	0.14	0.18	0.15	0.19	0.15	0.20

Notes: ordered probit / OLS regressions with robust standard errors clustered at country level. Individual controls include variables for political interest, radio and newspaper consumption, household income (log), size of household (square root), sex, age, age squared, education, working hours, employment status, marital status, children, area of living, and citizenship. Dummy variables indicating missing observations for political interest, household income, household size, sex, age, education, working hours, employment status, marital status, children, area of living and citizenship are included as well. *Significance levels:* ** $p \leq 0.01$, * $0.01 < p \leq 0.05$, (*) $0.05 < p \leq 0.1$.
Data Sources: European Social Survey (Jowell et al. 2003), Djankov et al. (2003), World Development Indicators (World Bank several years), Penn World tables 6.2 (Heston et al. 2006), Economic Freedom Network (Gwartney et al. 2007), IP Network (several years), Eurostat (2003), UNESCO (2008).

Table A3: Summary Statistics of Respondents with Different Time Opportunity Costs

Mean values/percentages		Flexibility of working hours as distinction criteria		Employment status / profession as distinction criteria	
	Whole population	Group with high opportunity costs of time	Group with low opportunity costs of time	Group with high opportunity costs of time	Group with low opportunity costs of time
Life satisfaction	6.94	7.47	6.95	7.26	6.54
TV consumption					
No TV at all	3.13%	3.08%	2.77%	3.80%	2.77%
Less than 0.5 hour TV	5.54%	6.86%	6.19%	8.62%	2.69%
0.5 to 1.5 hours TV	28.73%	38.23%	32.87%	40.41%	18.07%
More than 1.5 to 2.5 hours TV	29.44%	31.81%	32.50%	28.25%	27.16%
More than 2.5 hours TV	33.16%	20.02%	25.66%	18.92%	49.31%
Indiv./household characteristics					
Working hours	34.15	39.98	39.49	42.16	36.09
Household income (EUR, PPP)	1765.02	2912.78	2114.57	2619.23	1192.21
Age	46.25	40.91	39.43	43.28	63.69
Female	53.28%	41.63%	44.83%	37.14%	50.55%
Male	46.58%	58.30%	55.08%	62.75%	49.32%
Foreigner	4.20%	4.20%	5.71%	3.91%	2.83%
Citizen of country	95.72%	95.69%	94.18%	96.04%	97.08%
Children living at home	40.06%	49.39%	49.28%	52.75%	21.50%
Marital status					
Married, with partner	53.25%	58.10%	56.29%	63.48%	52.09%
Married, without partner	0.36%	0.40%	0.43%	0.43%	0.46%
Separated, with partner	0.31%	0.40%	0.31%	0.43%	0.22%
Separated, without partner	1.24%	1.24%	1.33%	1.39%	1.00%
Divorced, with partner	1.58%	2.21%	1.86%	2.10%	1.22%
Divorced, without partner	5.30%	5.71%	5.68%	5.07%	6.11%
Widowed, with partner	0.38%	0.13%	0.09%	0.11%	0.81%
Widowed, without partner	8.94%	1.46%	1.52%	1.70%	24.38%
Single, with partner	5.75%	10.16%	8.56%	7.44%	1.65%
Single, without partner	22.44%	19.83%	23.43%	17.42%	11.71%
Education					
Not completed primary education	4.24%	0.52%	1.21%	1.07%	8.56%
Primary or first stage of basic education	14.66%	5.01%	8.73%	6.92%	23.60%
Lower secondary or second stage of basic education	20.17%	15.25%	20.73%	10.50%	20.53%

Table to be continued

Continuation of Table A3

Upper secondary education	31.96%	33.21%	36.01%	22.87%	26.46%
Post secondary, non-tertiary education	5.88%	7.57%	6.55%	7.22%	4.18%
First stage of tertiary education	13.46%	22.61%	14.17%	31.39%	8.12%
Second stage of tertiary education	4.42%	8.89%	4.53%	14.45%	2.59%
Employment status					
Paid work, employed	40.59%	100.00%	100.00%	54.54%	0.00%
Paid work, self-employed	7.55%	0.00%	0.00%	45.46%	0.00%
Unemployed, looking for a job	3.37%	0.00%	0.00%	0.00%	12.45%
Unemployed, not looking for a job	1.62%	0.00%	0.00%	0.00%	6.24%
Education	9.10%	0.00%	0.00%	0.00%	0.00%
Permanently sick or disabled	2.13%	0.00%	0.00%	0.00%	0.00%
Retired	21.66%	0.00%	0.00%	0.00%	81.31%
Community or military service	0.23%	0.00%	0.00%	0.00%	0.00%
Housework, looking after children	11.49%	0.00%	0.00%	0.00%	0.00%
Area of living					
Big city	19.38%	17.36%	19.55%	21.06%	18.84%
Suburbs	13.01%	18.34%	13.05%	14.76%	11.91%
Town, small city	29.96%	28.32%	31.57%	27.45%	31.14%
Country village	30.92%	29.13%	29.89%	28.14%	31.77%
Farm, home in countryside	6.40%	6.49%	5.52%	8.39%	6.04%
Number of observations	89,208	6,793	7,042	12,696	21,013

Data sources: European Social Survey (Jowell et al. 2003; 2005),World Development Indicators (World Bank several years).

Table A4: Descriptive Statistics ESS 1 & 2 and WVS 3 & 4

	Mean	Standard deviation	Median	Minimum	Maximum	Number of observations
TV viewing (hours)	1.98	1.06	1.75	0.00	3.50	127,949
Residual TV viewing (hours)	0.00	0.94	-0.02	-3.41	3.21	127,949
Life satisfaction	6.71	2.39	7.00	1.00	10.00	127,949
TV channels	10.33	12.55	4.50	1.00	62.00	76

Data sources: European Social Survey Wave 1 & 2 (Jowell et al. 2003; 2005), World Values Survey Wave 3 & 4 (European Values Study Group and World Values Survey Association 2006), IP Network (several years).

Table A5: Diffusion of Terrestrial, Cable, and Satellite TV

Country	Survey	No. of TV channels for 70% of population	Only terrestrial TV	Cable or satellite TV
Austria	ESS 1	14	13%	87%
Austria	ESS 2	24	15%	85%
Belgium	ESS 1	32.5	3%	97%
Belgium	ESS 2	30	3%	97%
Brazil	WVS 3	3	89%	11%
Bulgaria	WVS 3	2	55%	45%
Belarus	WVS 3	3	83%	17%
Croatia	WVS 3	3	62%	38%
Czech Republic	ESS 1	4	71%	29%
Czech Republic	ESS 2	4	75%	25%
Czech Republic	WVS 3	4		
Denmark	ESS 1	5.5	17%	83%
Denmark	ESS 2	4	19%	81%
Estonia	ESS 2	3	49%	52%
Estonia	WVS 3	4	80%	20%
Finland	ESS 1	4	44%	56%
Finland	ESS 2	4	28%	72%
Finland	WVS 3	4	56%	44%
France	ESS 1	7	67%	33%
France	ESS 2	7	61%	39%
Germany	ESS 1	25	7%	93%
Germany	ESS 2	30	3%	97%
Germany	WVS 3	36	12%	88%
Greece	ESS 1	10	99%	1%
Greece	ESS 2	9	99%	1%
Hungary	ESS 1	3	37%	63%
Hungary	ESS 2	3	34%	66%
Hungary	WVS 3	3	20%	80%
Iceland	ESS 2	4	87%	13%
India	WVS 3	1	77%	23%
Ireland	ESS 1	6	40%	60%
Ireland	ESS 2	6	35%	65%
Italy	ESS 1	9	83%	17%
Japan	WVS 3	7	78%	22%
Latvia	WVS 3	3	69%	31%
Lithuania	WVS 3	4	78%	22%
Luxembourg	ESS 1	40	2%	98%
Luxembourg	ESS 2	40	1%	100%
Mexico	WVS 3	4		
Netherlands	ESS 1	29	1%	100%
Netherlands	ESS 2	26	1%	100%
Norway	ESS 1	4	31%	69%
Norway	ESS 2	4	28%	73%
Norway	WVS 3	4	44%	56%

Table to be continued

Continuation of Table A5

Poland	ESS 1	5	42%	58%
Poland	ESS 2	6	47%	53%
Poland	WVS 3	3	51%	49%
Portugal	ESS 1	4	57%	43%
Portugal	ESS 2	4	50%	51%
Romania	WVS 3	1	46%	54%
Russia	WVS 3	7	83%	17%
Slovakia	ESS 2	4	52%	48%
Slovakia	WVS 3	3	20%	80%
Slovenia	ESS 1	3	35%	65%
Slovenia	ESS 2	5	33%	67%
Slovenia	WVS 3	5	51%	49%
South Africa	WVS 3	4	80%	20%
South Africa	WVS 4	4	78%	22%
Spain	ESS 1	5	78%	22%
Spain	ESS 2	5	72%	29%
Spain	WVS 3	5	92%	8%
Spain	WVS 4	5	61%	39%
Sweden	ESS 1	3	28%	72%
Sweden	ESS 2	3	24%	77%
Sweden	WVS 3	3	37%	63%
Switzerland	ESS 1	39	5%	95%
Switzerland	ESS 2	41	6%	95%
Switzerland	WVS 3	31	23%	77%
Turkey	ESS 2	15	68%	32%
Ukraine	ESS 2	10	58%	42%
Ukraine	WVS 3	3	93%	7%
Macedonia	WVS 3	7		
Great Britain	ESS 1	5	53%	47%
Great Britain	ESS 2	5	36%	64%
United States	WVS 3	62	27%	73%
Venezuela	WVS 3	4	86%	14%

Data Source: IP Network (several years).

Curriculum Vitae

Christine Benesch was born on October 2nd, 1980 in Zurich, Switzerland. She attended the Kantonsschule Im Lee in Winterthur and graduated in 2000 (Matura Typus D). From 2000 to 2004 she studied Economics at the University of Zurich and graduated summa cum laude in 2004. 2004 to 2009 she attended the doctoral studies at the University of Zurich and worked as a research assistant at the chair of Prof. Dr. Dr. h.c. mult. Bruno S. Frey at the Institute for Empirical Research in Economics at the University of Zurich (2004-2008) and at the chair of Prof. Dr. Gérard Hertig at the ETH Zurich (2008-2009). Her dissertation project was supported with a scholarship by the Research Grant of the University of Zurich (Forschungskredit) and won the Mercator-Prize 2007.